



## CAR STEERING

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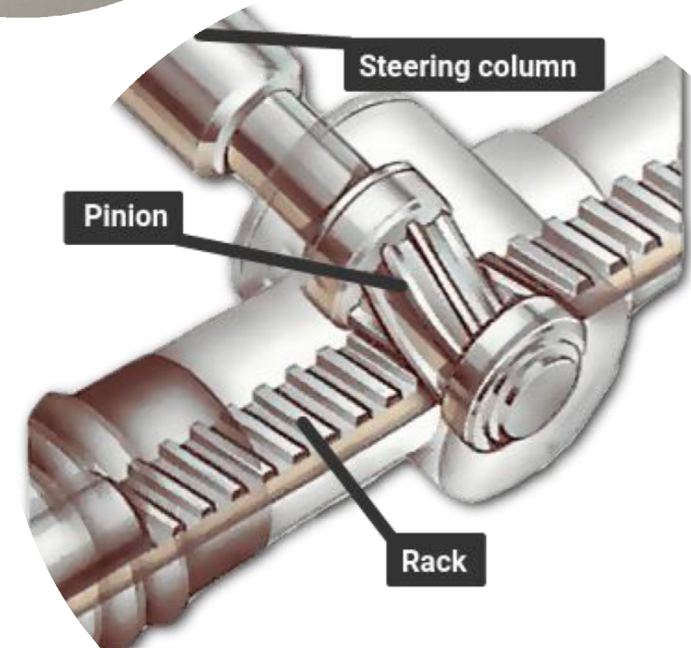
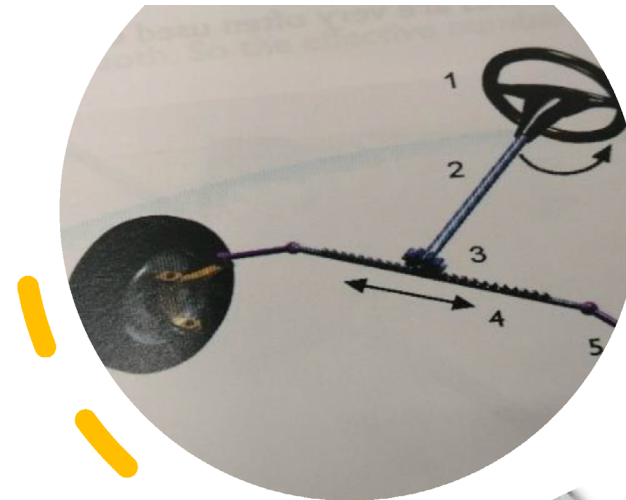


## How Does The Steering in a Car work?

- The steering system converts the rotation of the steering wheel into a swiveling movement of the road wheels in such a way that the steering-wheel rim turns a long way to move the road wheels a short way
- The steering effort passes to the wheels through a system of pivoted joints. These are designed to allow the wheels to move up and down with the suspension without changing the steering angle.
- They also ensure that when cornering, the inner front wheel - which has to travel round a tighter curve than the outer one - becomes more sharply angled.
- The joints must be adjusted very precisely, and even a little looseness in them makes the steering dangerously sloppy and inaccurate.
- There are two steering systems in common use - the rack and pinion and the steering box.

## Rack and pinion.

- The most common use of a rack and pinion is in a car steering system, such as the below. The steering wheel (1) turns the steering column (2), which turns the pinion. The pinion (3) moves the rack (4) from side to side to turn the car wheels via a linkage (5). Note that the pinion is a spur gear.
- At the base of the steering column there is a small pinion ( gear wheel) inside a housing. Its teeth mesh with a straight row of teeth on a rack - a long transverse bar.
- Turning the pinion makes the rack move from side to side. The ends of the rack are coupled to the road wheels by track rods.
- This system is simple, with few moving parts to become worn
- or displaced, so its action is precise.
- A universal joint in the steering column allows it to connect with the rack without angling the steering wheel awkwardly sideways.



# The steering-box system

- Another mechanism for the steering in a car is The Steering-Box.
- At the base of the steering column there is a worm gear inside a box. A worm is a threaded cylinder like a short bolt. Imagine turning a bolt which holding a nut on it; the nut would move along the bolt. In the same way, turning the worm moves anything fitted into its thread.

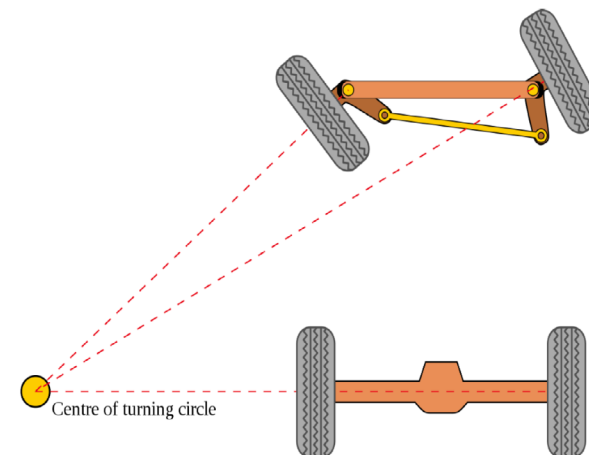


# LINKAGES

Linkages is another way that cars turn their wheels. It is commonly used in go karts.

A **steering linkage** is the part of an [automotive steering system](#) that connects to the front wheels.

The steering linkage which connects the steering gearbox to the front wheels consists of a number of rods. These rods are connected with a socket arrangement similar to a ball joint, called a tie rod end, allowing the linkage to move back and forth freely so that the steering effort will not interfere with the vehicle's up-and-down motion as the wheel moves over roads. The steering gears are attached to a rear rod which moves when the steering wheel is turned. The rear rod is supported at one end.





## Please watch videos

These are videos that I took myself from home.

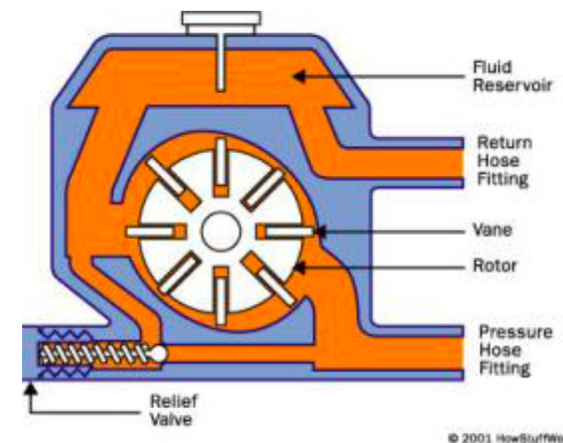
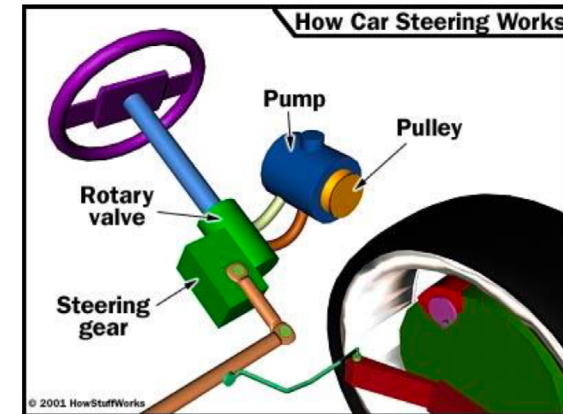
[GO-kart video](#)

[car video](#)

[tractor video](#)

## POWER STEERING

- Power steering helps aid the driver turn the wheels which would be too hard on your own. Power steering is when the hydraulic fluid is pushed around with a pump which is spun by the engine.
- Pump
- The hydraulic power for the steering is provided by a **rotary-vane pump**. This pump is driven by the car's engine via a belt and pulley. It contains a set of retractable vanes that spin inside an oval chamber.



## Comparing



- I took a video of a car that works with power steering, a tractor with no power steering and a go-kart that uses a linkage mechanism.
- The car was the easiest to turn because of the power steering and it took a lot of turning to make the wheel go the whole way over. The tractor was a bit harder to turn but still took its time to turn the wheel the whole way over. The go-kart turned the wheels easily and very quickly, it took a half a turn to move the wheels over.



## What does the mechanism do?

The function of the mechanism is Used so that the steering wheel can turn the wheels.  
The steering wheel Can turn the wheels by the steering wheel turning the pinion to move it up and down the rack which makes the wheels turn.

## Why is it needed?

It is needed so that the wheels can turn the right way as quick as you want it so you don't cause accidents.

## Where is the mechanism in the car?

The mechanism is located in the front of the car, it connects the steering wheel with the wheels to turn the car.

## MY OPINION

In my opinion of the steering in the car is fairly confusing at first but longer you're studying it the easier it gets to understand the steering. I think that it was a very good idea that they use a rack and pinion to control the steering in a car because it makes it easy to understand how the steering wheel can turn in a rotary and make the wheels go in a linear motion.



## Overall Judgement

Excellent use of primary and secondary sources to compare different systems of steering. The use of video was highly effective for communicating the analysis of the research.

The student has shown an excellent understanding how steering systems act as a controlled system.

Where a critical evaluation was not fully present, but the work presented did include relevant and accurate conclusions.

There was critical consideration taken on how best to present the different aspects of this Classroom-Based Assessment. Overall, it was presented to a very high standard and the work demonstrated an excellent use of IT skills as well as communication skills.

## Overall Judgement

Exceptional

