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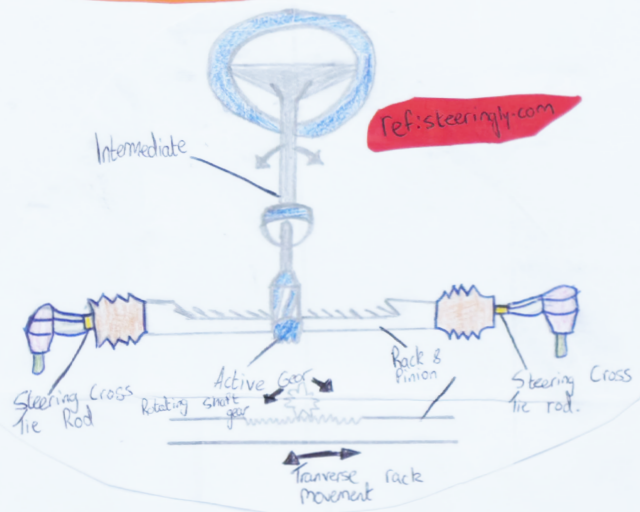
Junior Cycle Engineering Classroom-Based Assessment 2: Example of Student Work 04

January 2024

Rack-and-Pinion

The most common steering system in a Go Kart is called a rack-and-pinion. In a rack-and-pinion the movement of the handle rotates the pinion which in turn moves the rack sideways. ref: www.khkgear.net

Diagram



Rack-and-Pinion Pros & Cons

ref: parkindustries.com

Pros

- Accuracy is not restricted by length.
- It's easy to service.
- It's also better equipped for faster speeds.

Cons

- It's more complicated to manufacture.
- There are less mounting options.
- Potential backlash on older models.

History of Go-Karting

Go karting began in 1956 when Art Ingels invented the first ever go-kart. The first organized race happened in 1957 between 12 homemade machines in the parking lot of the Rose Bowl in California. While Ingels created the first go-kart, in 1958, Duffy Livingston and Ray Desbrow started Go Kart Manufacturing. ref: boardocks.com

Safety Precautions

- Wear a helmet
- Tie up long hair
- Wear a neck brace
- Ensure Go-Kart is in good condition.



ref: Bing.com

Go Kart Steering System

By Jayden Ajayi



ref: img-fruugo.com

What's a Steering System

Steering is the control of the direction of locomotion. ref: Wikipedia

How Does Go Kart Steering Work

Using a Go Kart is very easy when you get used to it and it's quite when you use it. Go Kart Steering wheels are made of aluminum and attached to steering shaft and two tie rods. These connect to the spindles on each side, that turn when you turn your steering wheel. ref: acekarts.com.au

How Does Power Steering Work?

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.

ref: auto-howstuffworks.com

References

- www.khkgear.net
- parkindustries.com
- steeringly.com
- Bing.com
- acekarts.com.au
- img-fruugo.com
- Wikipedia
- auto-howstuffworks.com
- boardocks.com

Teacher annotations using the Features of Quality

The annotations capture observations by the teacher, using the features of quality, with a view to establishing the level of achievement this work reflects. The annotations and judgments were confirmed by a Quality Assurance group, consisting of practising teachers and representatives of the NCCA, the Inspectorate, the State Examinations Commission and the Oide support service.

Teacher annotations

Research and analysis:

The research method chosen was appropriate for their area of learning and generated a suitable analysis. The student referenced secondary sources for each steering system presented. Where appropriate, the use of primary sources could have complimented the student's analysis of the concepts.

Exploring concepts:

The response demonstrated some level of understanding of concepts relevant to the theme. This was evidenced by a brief overview given for each steering system, and by some understanding demonstrated in relation to a rack and pinion system. A higher level of understanding of concepts relating to the operation of a steering system could have been demonstrated using a prototype model.

Communicating their work:

The findings were well presented using an annotated sketch and pictures on a poster display. The student carefully considered what information best communicated their Classroom-Based Assessment with key points highlighted using coloured information notes.

Overall judgement:  In line with expectations