



NCCA

An Chomhairle Náisiúnta
Curaclaim agus Measúnachta
National Council for
Curriculum and Assessment

Junior Cycle Engineering Classroom-Based Assessment 2: Example of Student Work 03

January 2024

STEERING SYSTEMS IN TRUCKS

RACK AND PINION

Rack and Pinion is a type of Steering System. It has one

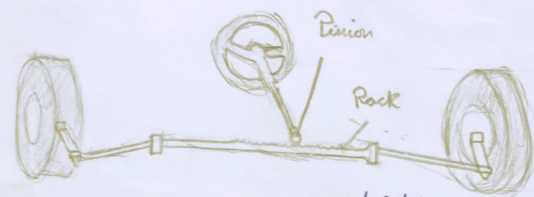
Main function: Conversion of the steering wheels rotational motion into the linear motion needed for the vehicle's wheels to turn.

PROS

- Easy to Service
- Better Equipped
- Maintain Higher Speeds

CONS

- Less Mounting Options
- More Complicated to Manufacture
- Rack And Pinion for apart can cause Backlash



Ref: CAR AND DRIVER 26/09/23



Ref: TRUCK 28/09/23

ELECTRIC POWER STEERING

Electric Power Steering uses an electric motor instead of a hydraulic system to assist the driver of the vehicle

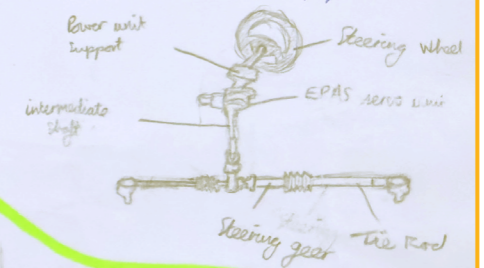
PROS

- Simple & Easy to maintain
- More efficient
- Greater fuel efficiency

CONS

- Poor Calibration
- Reduced driver feel
- Can't easily be fixed

REF: WIKIPEDIA 28/9/23
ZIG WHEELS 28/9/23



Steering Systems are the control of direction of locomotion. Trucks use both manual steering systems and power steering systems. The first steering system for a truck was a power steering system put on a Columbia 5-ton truck in 1903.

Ref: WIKIPEDIA 11/09/23
25/09/23

TYPES OF STEERING: RECIRCULATING BALL

The recirculating ball steering system contains a worm gear inside a rack with a threaded hole in it; this block has gear teeth cut into the outside to engage the sector shaft, which moves the Pitman arm.

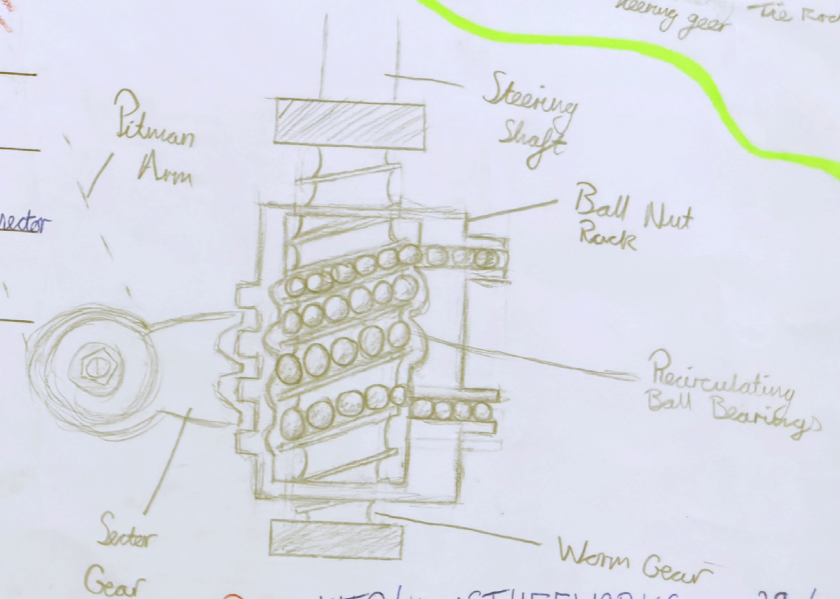
PROS

- Durable
- Withstand higher loads and shocks
- No heat generation during operation

CONS

- More Costly
- Has vibrations
- Requires high degree of cleanliness

Ref: WIKIPEDIA 28/09/23



Ref: AUTO/HOWSTUFFWORKS 28/09/23

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 an overview given for each steering system, and by an analysis of the advantages and disadvantages of each steering 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 a series of rendered sketches on a well-organised poster. The student carefully considered what information best communicated their Classroom-Based Assessment. Greater detail in the sketches and/or the use of a prototype model could have enhanced the communication of the findings.

Overall judgement:  In line with expectations