

GL 105

Kinematic model: gear drive



Description

- investigation of single-stage and multistage spur gears
- investigation of planetary gears

The gear is the element of a machine that transmits and transforms motion. A gear comprises at least one drive, an output and a frame.

Gear drives are uniform translation gears. The rotary motion is transferred from one shaft to a second through positive transmission by gears.

In spur gears, the gears are mounted on parallel axes. The drive and the output shaft are arranged in parallel. Planetary gears are a type of spur gears, in which the drive and the output shafts are on the same axle.

The GL 105 experimental unit can be used to study gear drives in the form of spur or planetary gears. The unit focuses on the consideration of kinematics. The experimental unit consists of a base plate with a fixed axle, on which is mounted a pivoting rail. Two other axles can be attached at any position on this rail. Selecting and combining the gears with different numbers of teeth allows you to realise different transmission ratios and gear types.

The rail is locked in experiments with spur gears. Depending on the aim of the experiment, one or two additional axles can be positioned on the rail. The gears can be coupled to each other via driving pins or to the fixed axle. It is driven by hand. The full revolutions are counted to determine the transmission ratio.

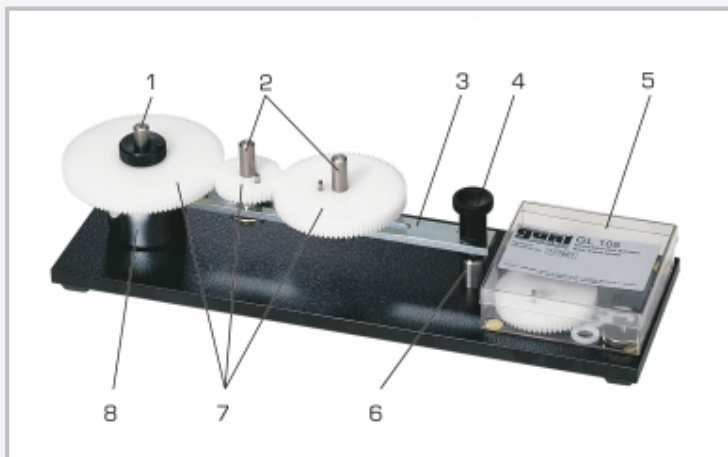
To investigate planetary gears, the rail is released and pivoted about the fixed axle. The rail serves as a planetary wheel support on which the planetary wheels are positioned and represents the input of the gear. The sun wheel forms the output of the gear. It is driven by hand. The transmission ratio can be determined by counting the full revolutions.

Learning objectives/experiments

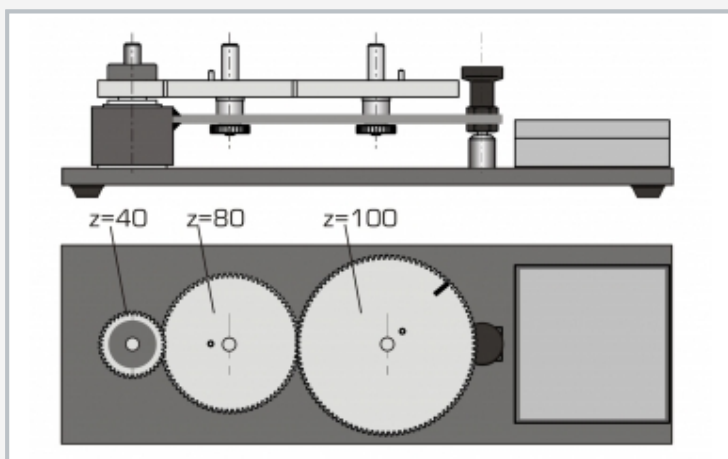
- investigation of single-stage or multistage spur gears
- investigation of planetary gears
- determine the transmission ratio

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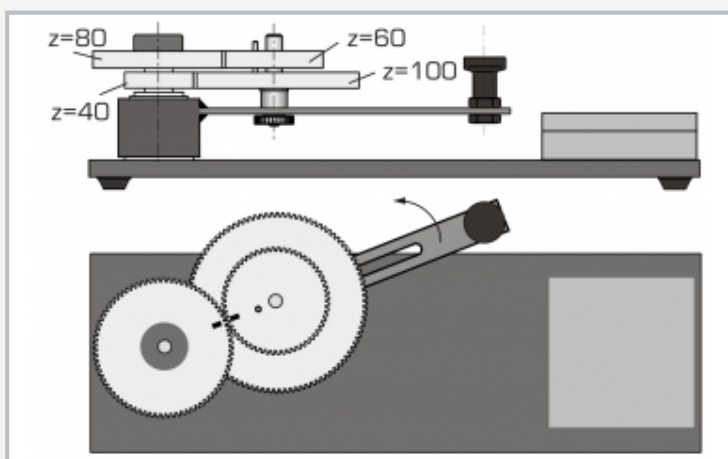
Kinematic model: gear drive



1 fixed axle, 2 additional axles arranged at any point, 3 rail, 4 handle, 5 storage box, 6 rail lock, 7 gears, 8 bearing



Experimental setup with locked rail and two additional axles
Gear with intermediate wheel: driving wheel (40 teeth), intermediate wheel (80 teeth), driven wheel (100 teeth)



Experimental setup with unlocked rail and one additional axle
Planetary gear: driven wheel (40 teeth) coupled to the fixed axle, driven via rail, rail as planetary gear, planetary wheels (100 teeth, 60 teeth), sun wheel as driven wheel (80 teeth)

Specification

- [1] investigation of single-stage or multistage spur gears
- [2] investigation of planetary gears
- [3] driven by hand
- [4] determine the transmission ratio by counting the revolutions of the driven gears
- [5] base plate with storage for components

Technical data

Gears

- quantity: 4
- plastic
- module: 1mm
- number of teeth: 40, 60, 80 and 100

LxWxH: 380x120x100mm

Weight: approx. 3kg

Scope of delivery

- 1 kinematic model
- 1 set of instructional material

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Kinematic model: gear drive

Gear trains model

Optional accessories

020.30009

WP 300.09

Laboratory trolley