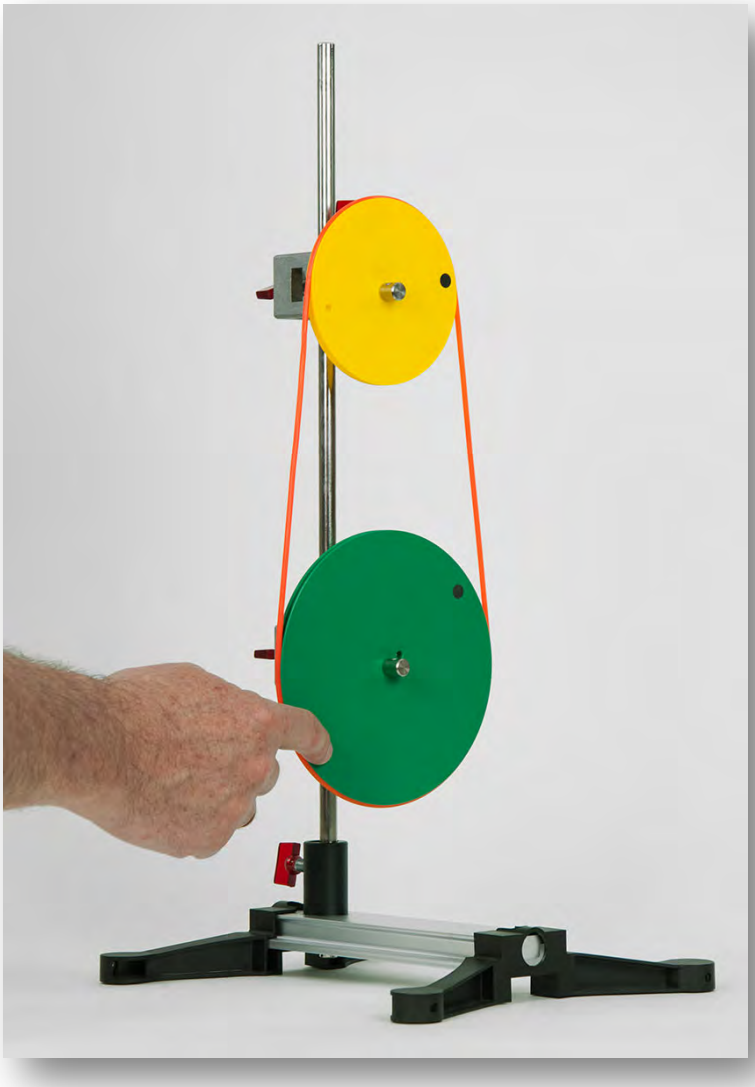
BELT DRIVE

MED 11.07



Material

Item-no.	Qty.	Description
DS090-3K	1	Claw base "Sepp", 260 x 220 mm
P7240-1G	1	Support rod, round, L=500 mm, D=10 mm
DS095-3K	2	Bosshead cross-pattern, demo 03
DS204-2L	2	Bearing pin with clamp insert
DM210-10	1	Belt pulley D=100 mm, yellow
DM210-15	1	Belt pulley D=150 mm, green
DS401-1A	1	Drive belts, set of 2
DS402-2N	1	Crank pin, L=50 mm
DM210-50	1	Circular disc with groove, D=50mm, red
DM210-75	1	Circular disc with groove, D=75mm, blue

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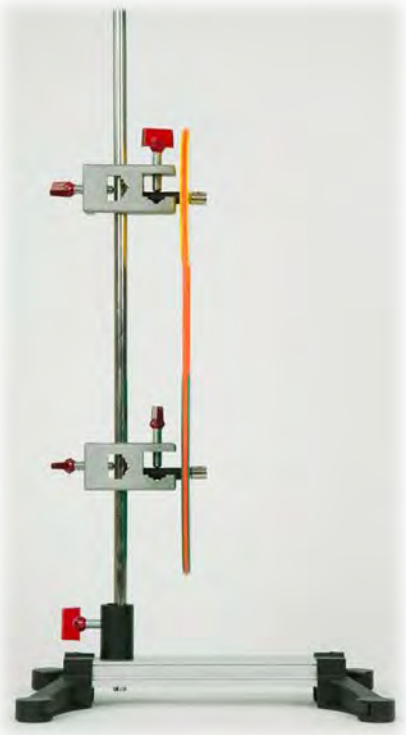
Purpose
Get to know gear transmission ratio and directions of rotation in gearboxes.

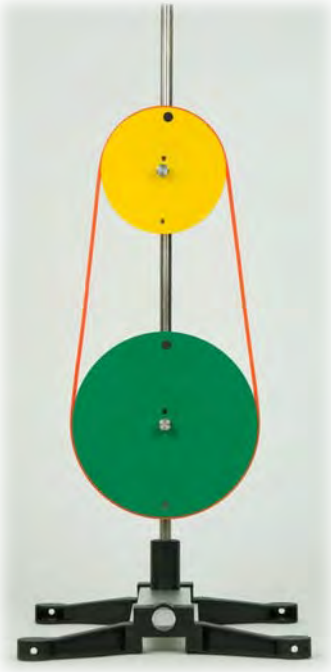
Preparation



Insert the 500 mm support rod into the sliding saddle of the claw base and fix the two bossheads at a height of 15 and 30 cm.

The two belt pulleys (green and yellow) are mounted in the bosshead with the help of the bearing pin with clamp insert.

The long driving belt is placed around the belt pulleys; taut the driving belt by moving the upper bosshead.



The two black marking dots of the belt pulleys should be in a vertical line.

Screw the crank pin to the bottom belt pulley.

Experiment 1
Turn the larger belt pulley slowly and observe the directions of rotation and the turns.

Result
The directions of rotation are the same for the two belt pulleys.
The smaller belt pulley turns faster than the large belt pulleys, thus resulting in a change of the torque.

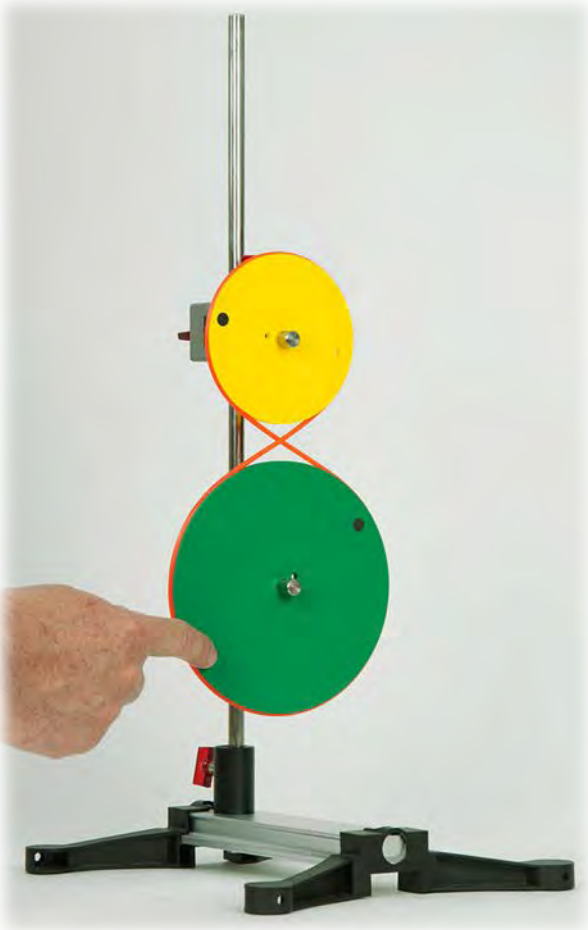
$$F \times r_{large} > F \times r_{small}$$

The same force – transferred by the drive belt – creates a smaller torque on the small belt pulley.

Torque : Torque = Turn : Turn (3 : 2 = 3 : 2)

Experiment 2
The driving cords are mounted crosswise as shown on the image to the below.

Observe the directions of rotation and the turns again.



Result
The direction of rotation of both disks is opposite.

Additional experiment
Experiment with different gear transmission ratio by using different belt pulleys.

Note
Drive belts can stretch a little and slip on the belt pulleys which has advantages and disadvantages compared to sprockets with chain connection.