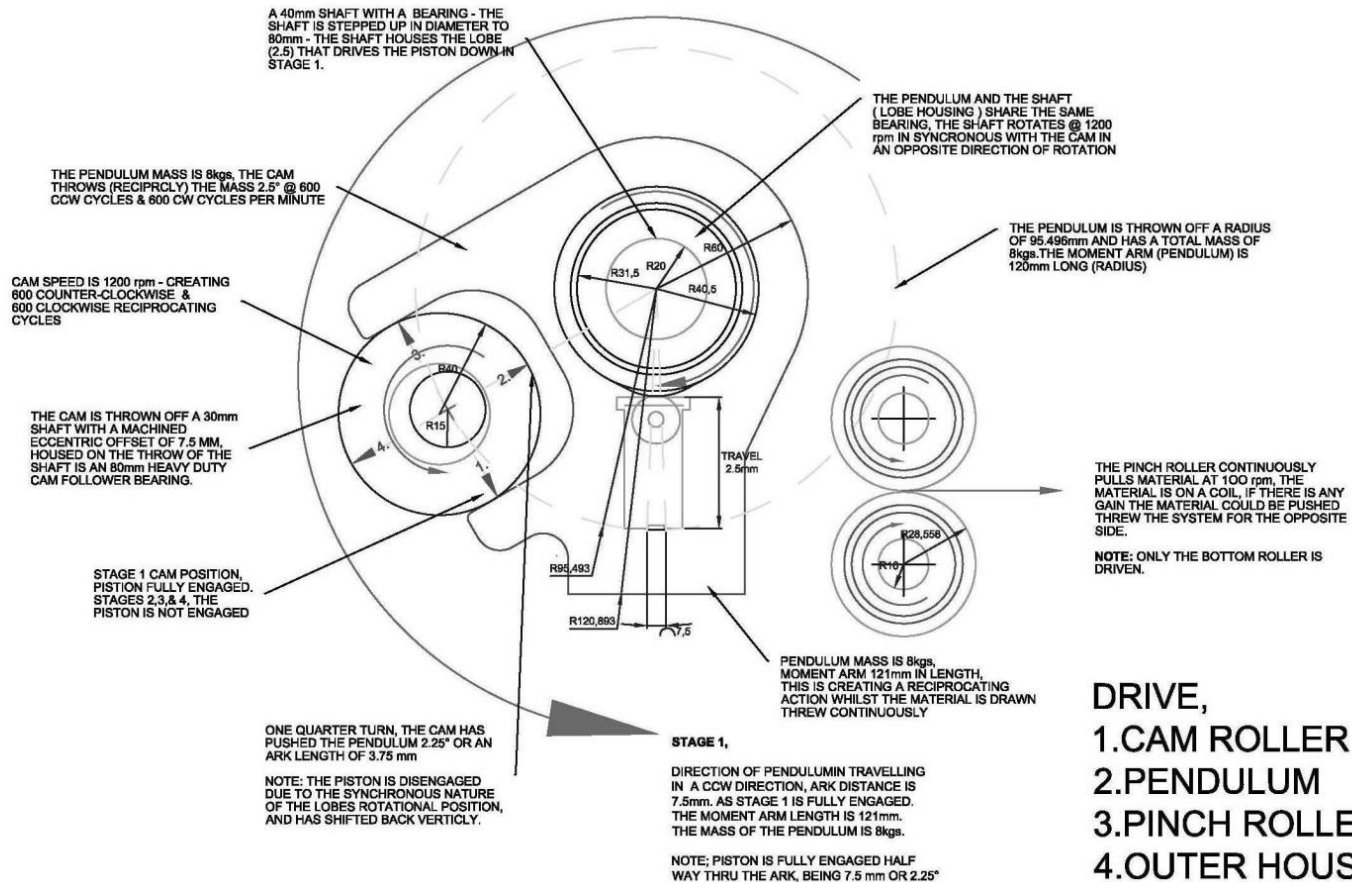


Base picture



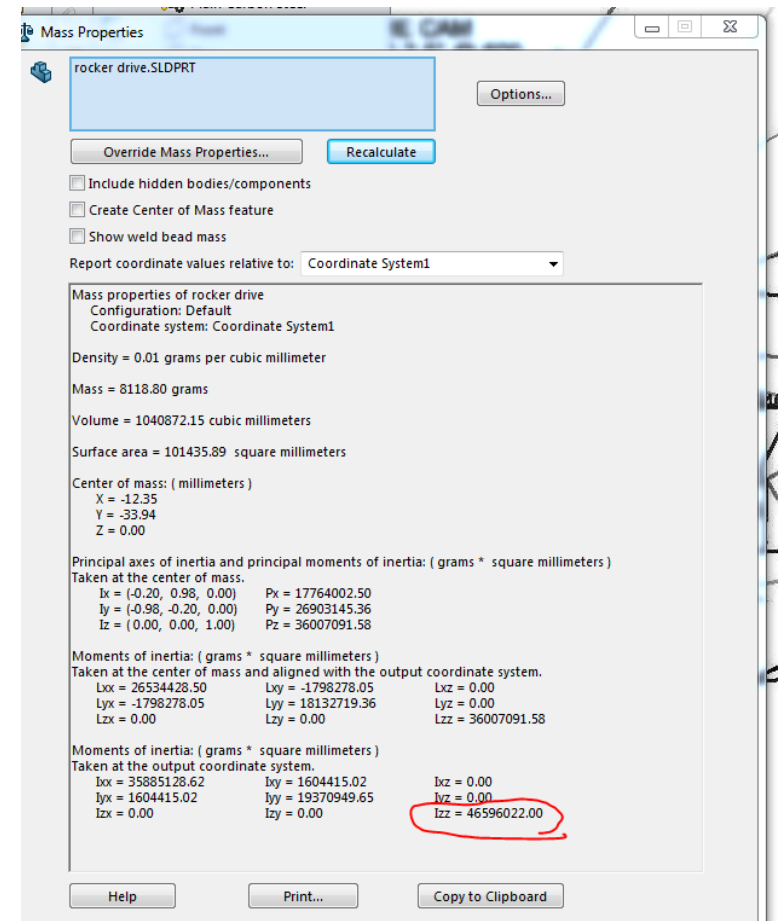
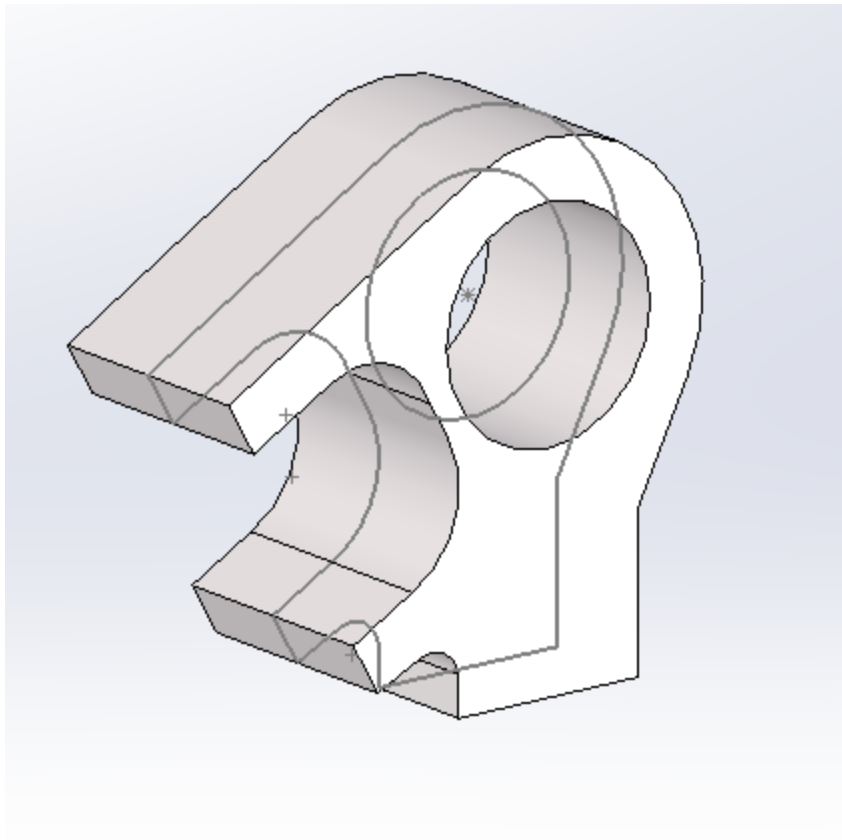
- DRIVE,**
- 1.CAM ROLLER
 - 2.PENDULUM
 - 3.PINCH ROLLER
 4. OUTER HOUSING

NOTE,

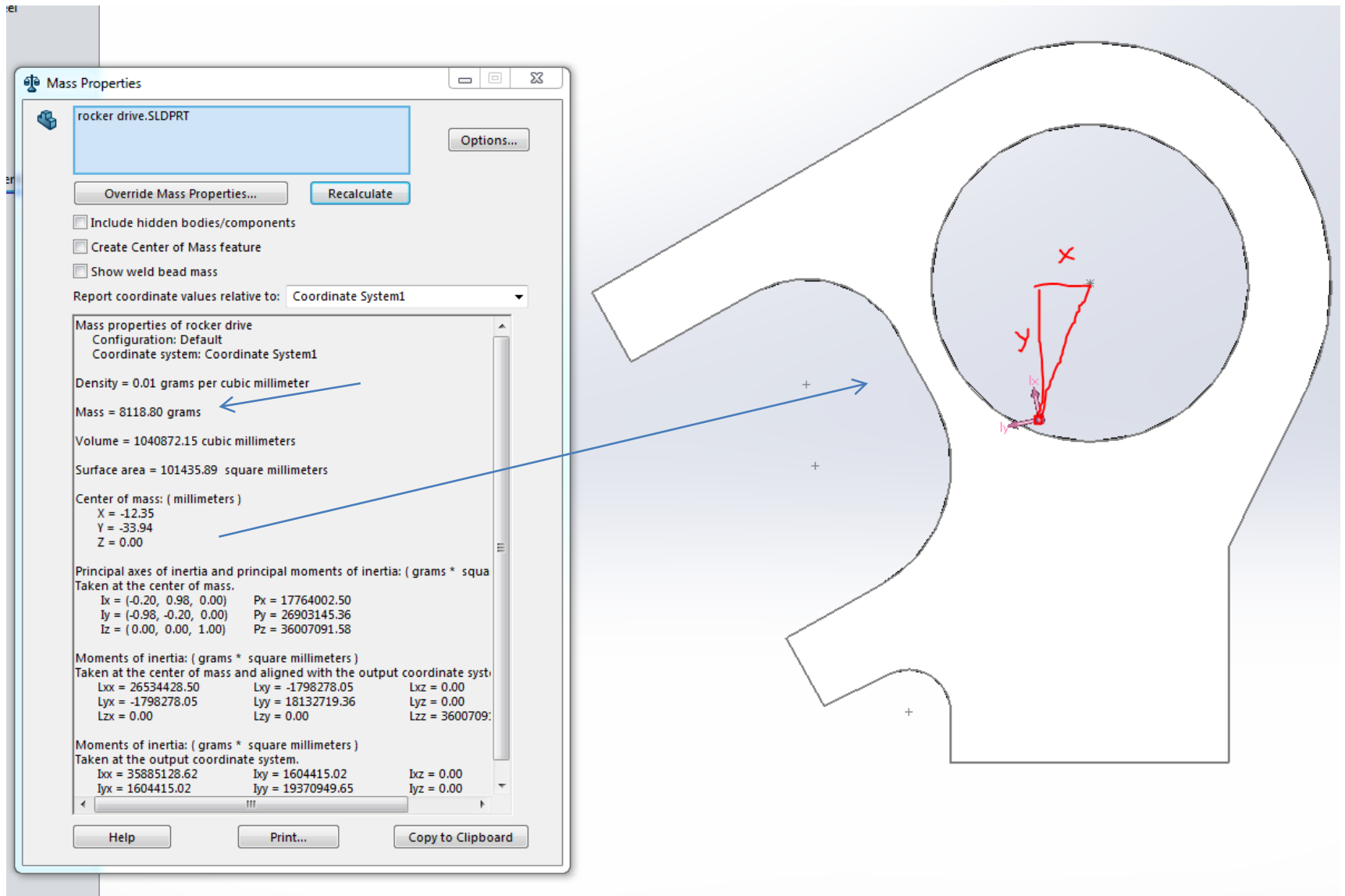
THE SYTEM IS SUPPORTED BY OUTER PLATES HOUSING BEARINGS TO ALIGN ALL OF THE COMPONENTS OF THE DRIVE.

With your picture as underlay I modelled the pendulum in CAD (material steel) to be able to quickly determine the position of the center of gravity as well as the moment of inertia taken at a coordinate system I located at the shaft center (hole center) See also next page. I extruded the sketch until the required mass was reached.

The moment of inertia taken at hole center is $I_{zz}=46596022$ grams*²square millimeters.

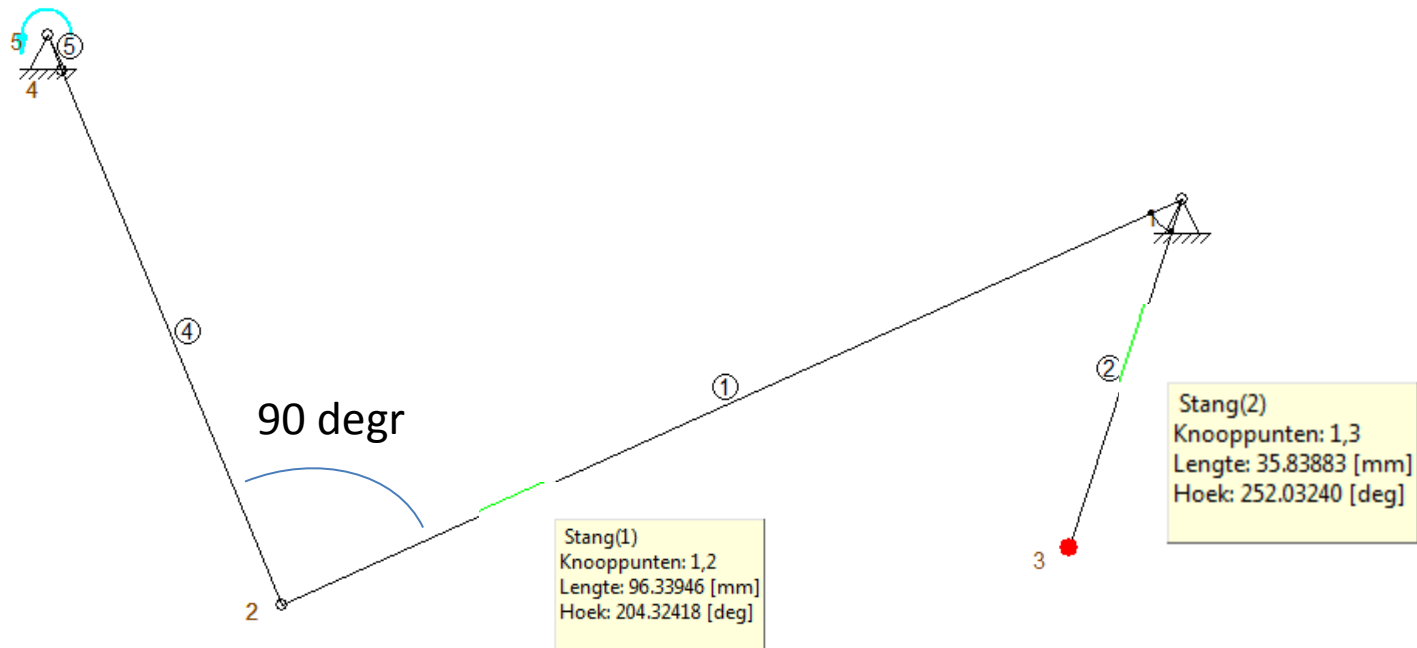


The center of gravity is at $x=-12,35$ and $y=-33,94$ mm from hole center.
The mass I reached is 8118 grams, slightly over 8 kg. Good enough.

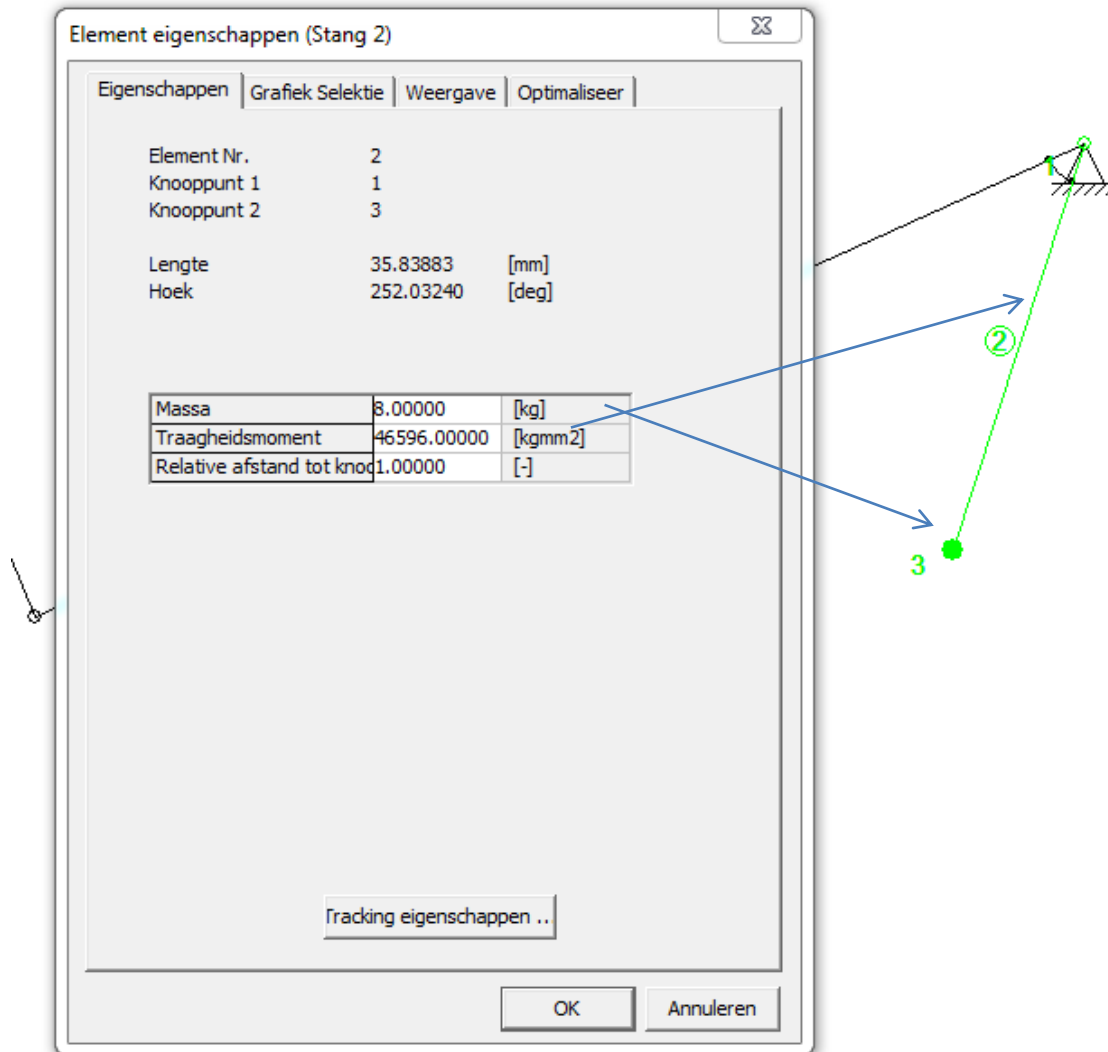


In mechanism software SAM I sketched the pendulum/excentric mechanism with equal dimensions as original: center of gravity is at the red dot.

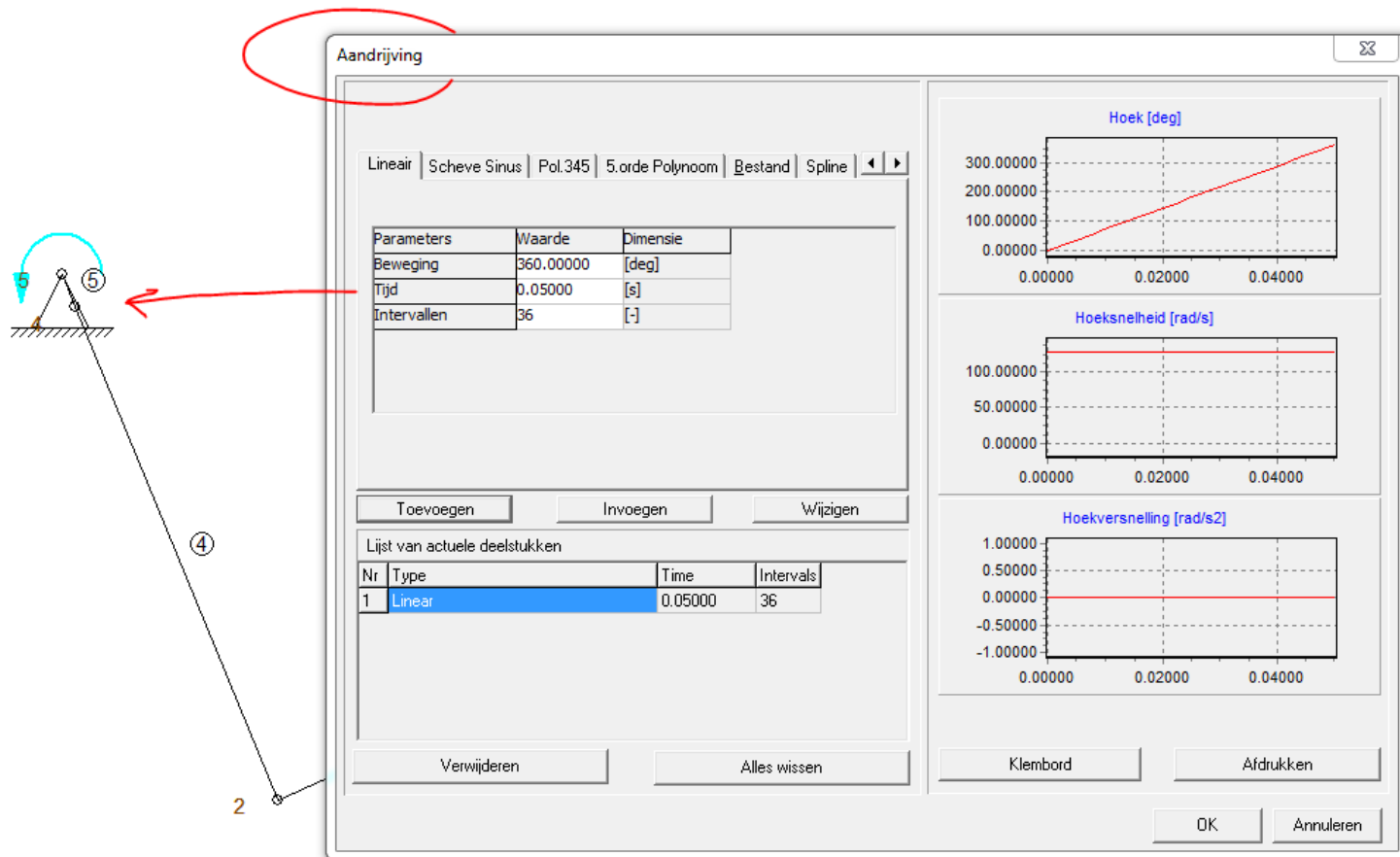
Rod 2 is 35,8 mm long. Rod 1 is 96 mm long. Rod 5 (the eccentric) is rotating and its length is 3,75 mm so the swivel stroke at hinge 2 is 7,5 mm. Rod 4 is the rollerbearing and its length is not important. The angle between rod 1 and rod 4 is 90 degr.



Rod 2 I gave the correct moment of inertia (in kgmm²) and the mass is at point 3.

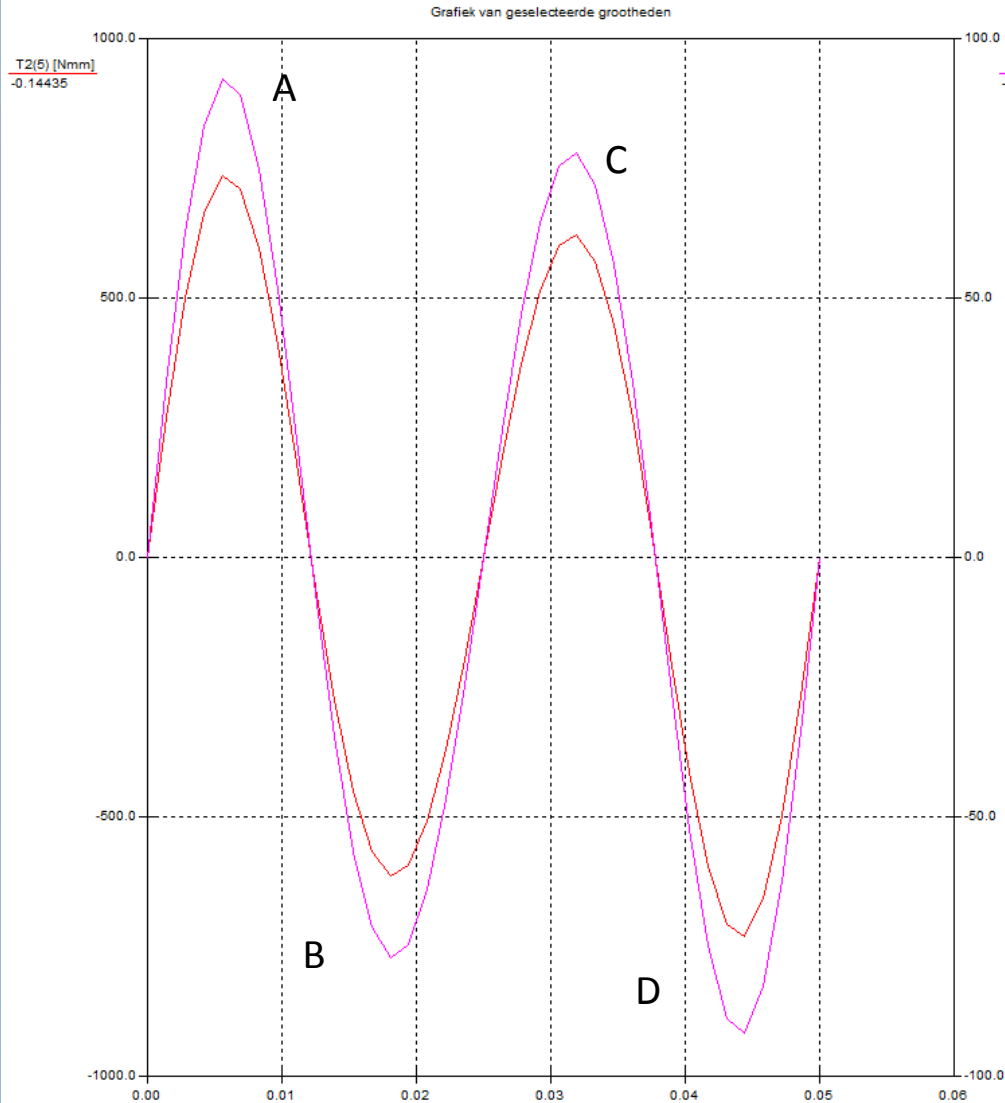


The drive is at point 5 driving the eccentric. Time per 360 degr revolution is 0,05 secs (=1200 rpm)



Graph of cam torque and power

Red
curve
Torque
(Nmm)



Purple
curve
Power
(Watt)

We see that there are 4 maxima in torque (and thus in power) during one cam revolution.

A is equal in value to D and approximately 732 Nmm (and 92 Watt)

B is equal in value to C and app 615 Nmm (and 77 Watt)

Tijd [s]
0.05000 Time(s)

Conclusion

The above torque and power values are to drive the pendulum motion purely. So no friction is included, nor forces that the rocker may feed back onto the pendulum during its job.

Also no friction of the cam shaft rotation is included.

The mechanism appears to be laid out quite well. The center of gravity is relative close to the rotation center. The cam shaft is relatively big in diameter and that is positive to maintain vibration free and constant rotational speed (1200 rpm).

The peaks in the graph have a frequency of $20 \times 4 = 80$ Hz.

Torque and power are relative low.