Warsaw University of Technology

Faculty of Mechatronics

Theory of Machines and Devices

Project 02

Report

Kinematic analysis of four-made bar

Made by:

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1. Introduction

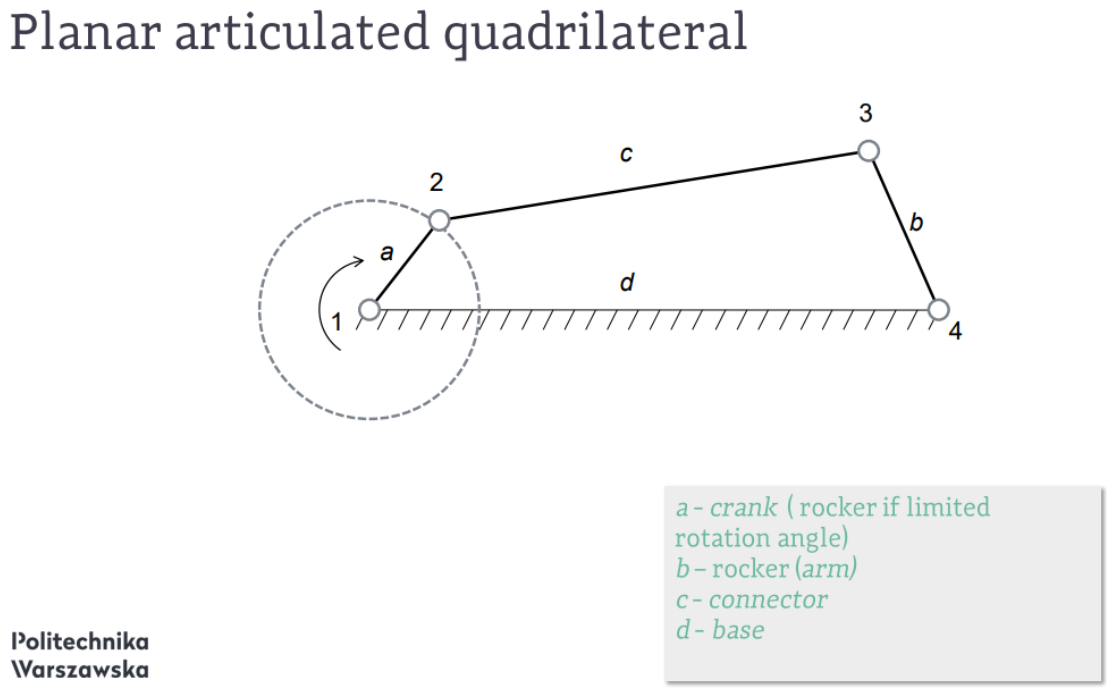


Figure-1.1 Four made Bar.

Reversing position of the mechanism – A position where, with the active link velocity sense, the velocity vector sense of at least one of the other members can change.

Bar *a* is an active link – because it rotates without limits it is called a crank

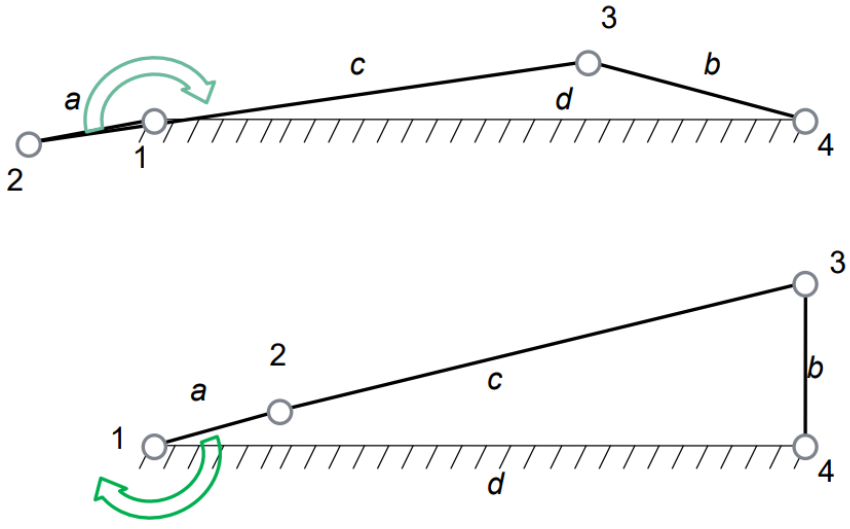


Figure-1.2 Theory explaining a Bar and a Crank.

2. Course of the exercise

In this exercise, we are going to perform a kinetic analysis of four-made bars with Autodesk Inventor and GIM or MATLAB. We must compare 4 different angular positions of the crank. I have chosen to perform the exercise in Autodesk Inventor and GIM software.

3. Schematic of the Design in Inventor

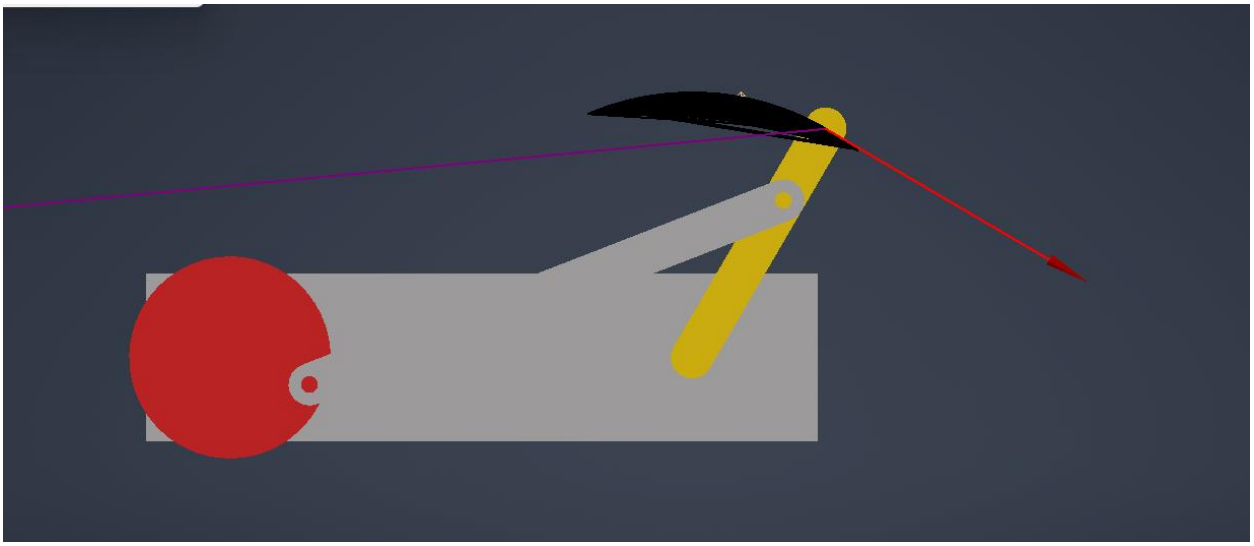


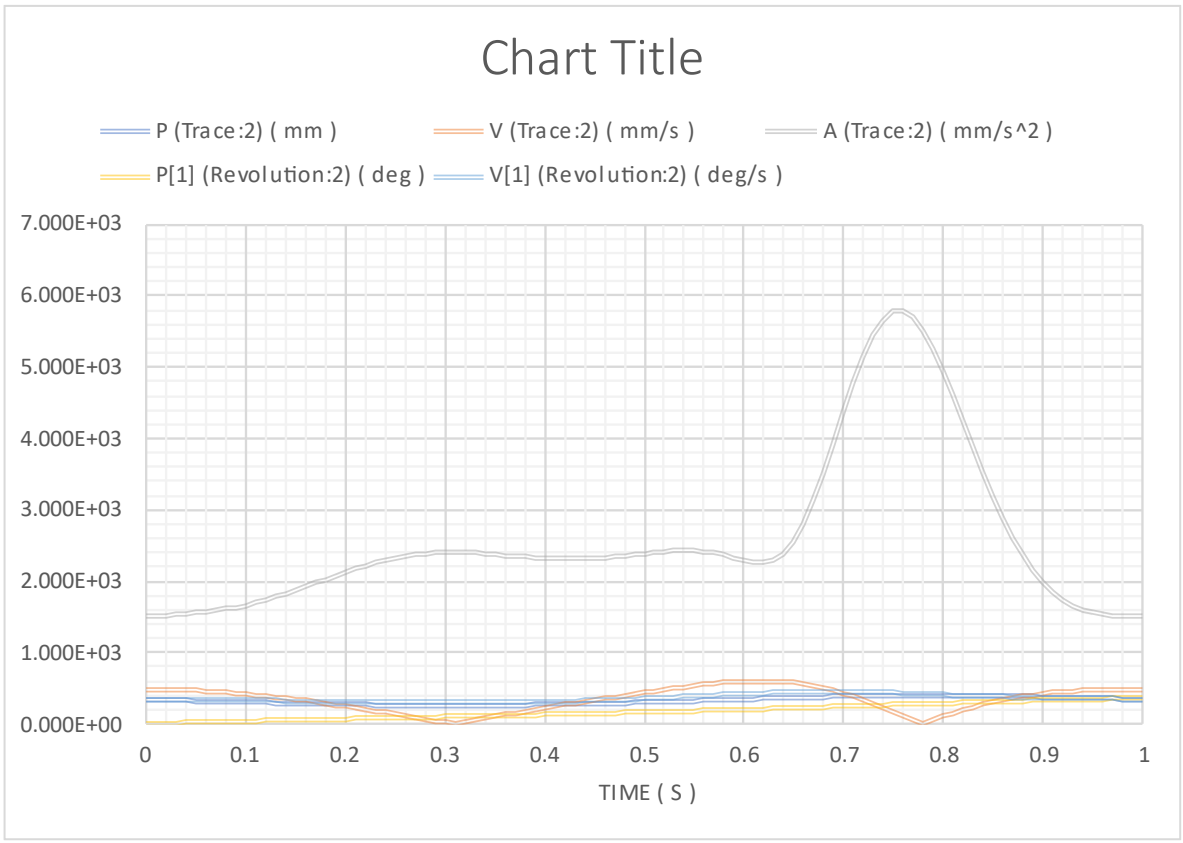
Figure-3.1 Schematic of the Design

4. Comparison of four angle positions of the Design in Inventor

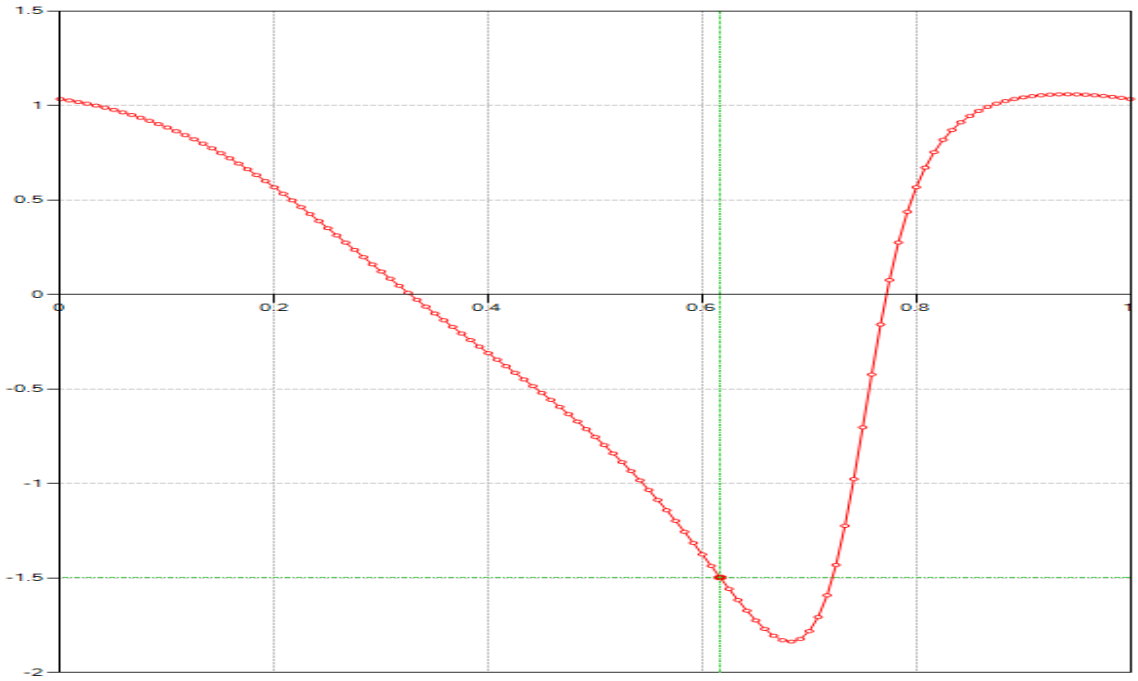
Position no.	Time (s)	P (Trace:2) (mm)	V (Trace:2) (mm/s)	A (Trace:2) (mm/s^2)	P1 (Revolution:2) (deg)	V1 (Revolution:2) (deg/s)
1	0.27000	259.75000	86.74160	2373.13000	89.56730	301.93400
2	0.55000	321.34100	534.15000	2424.46000	180.62600	386.90400
3	0.76000	392.99500	116.04100	5784.60000	271.78200	430.86800
4	0.99000	345.61400	487.89100	1510.05000	359.19300	346.93700

Figure-4.1 Table showing four positions angles.

5. Comparison of Inventor Output Grapher and Output graphs from GIM



*Figure**Error! No text of specified style in document.**-5.1 Plot presenting position of the crank over multiple revolutions (Inventor).*



*Figure**Error! No text of specified style in document.**-5.2 Plot presenting position of the crank over multiple revolutions (GIM).*