

Introduction

Understanding the motion characteristics of a mechanism is an important step toward designing machinery to accomplish a give set of tasks. The purpose of this research is to understand the motion characteristics of a linkage as a design parameter is altered.

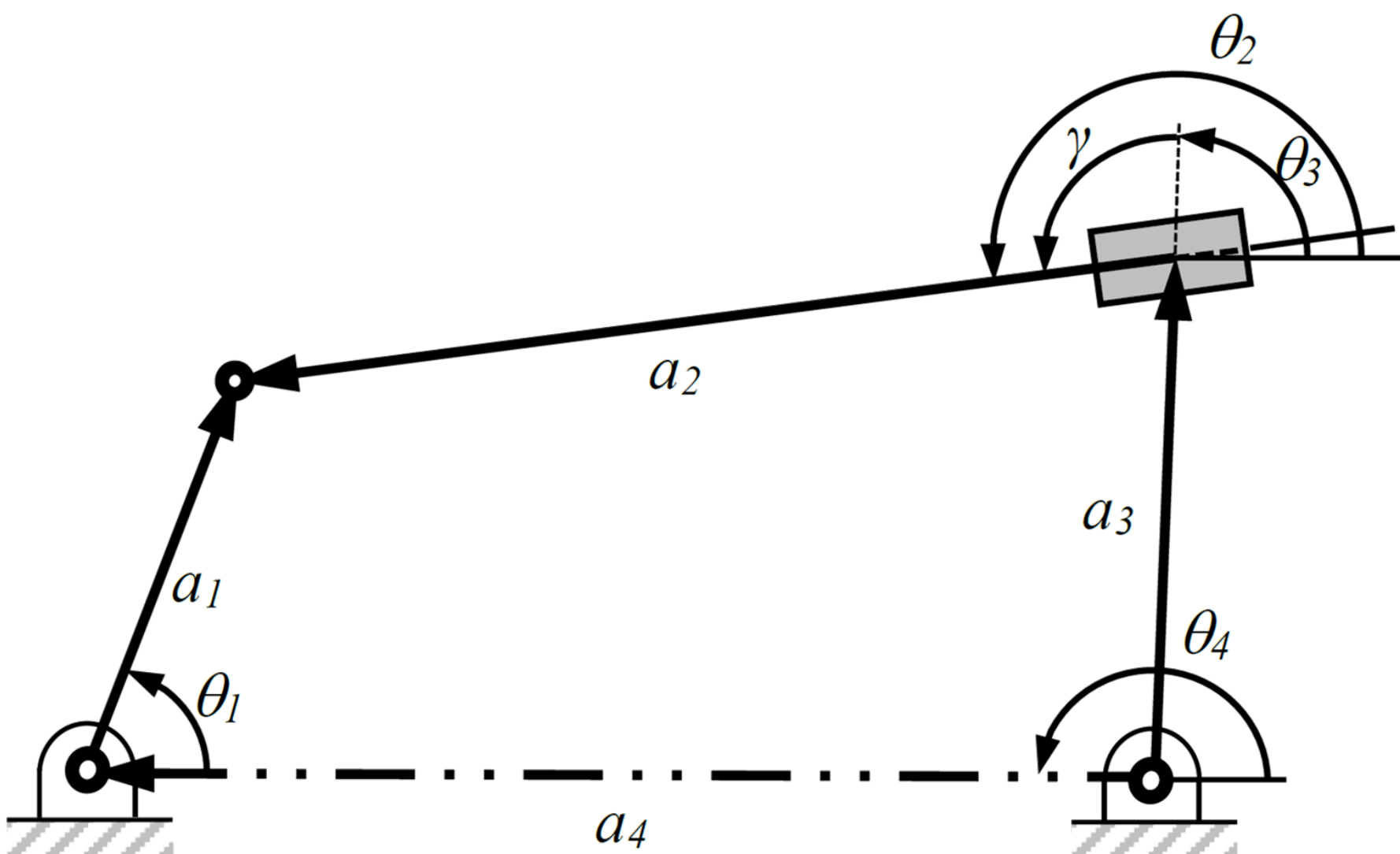
Method

- I. Build a mathematical model for the linkage.
- II. Find solutions for the set of equations in the mathematical model.
- III. Validate the results by drawing the mechanism in SolidWorks

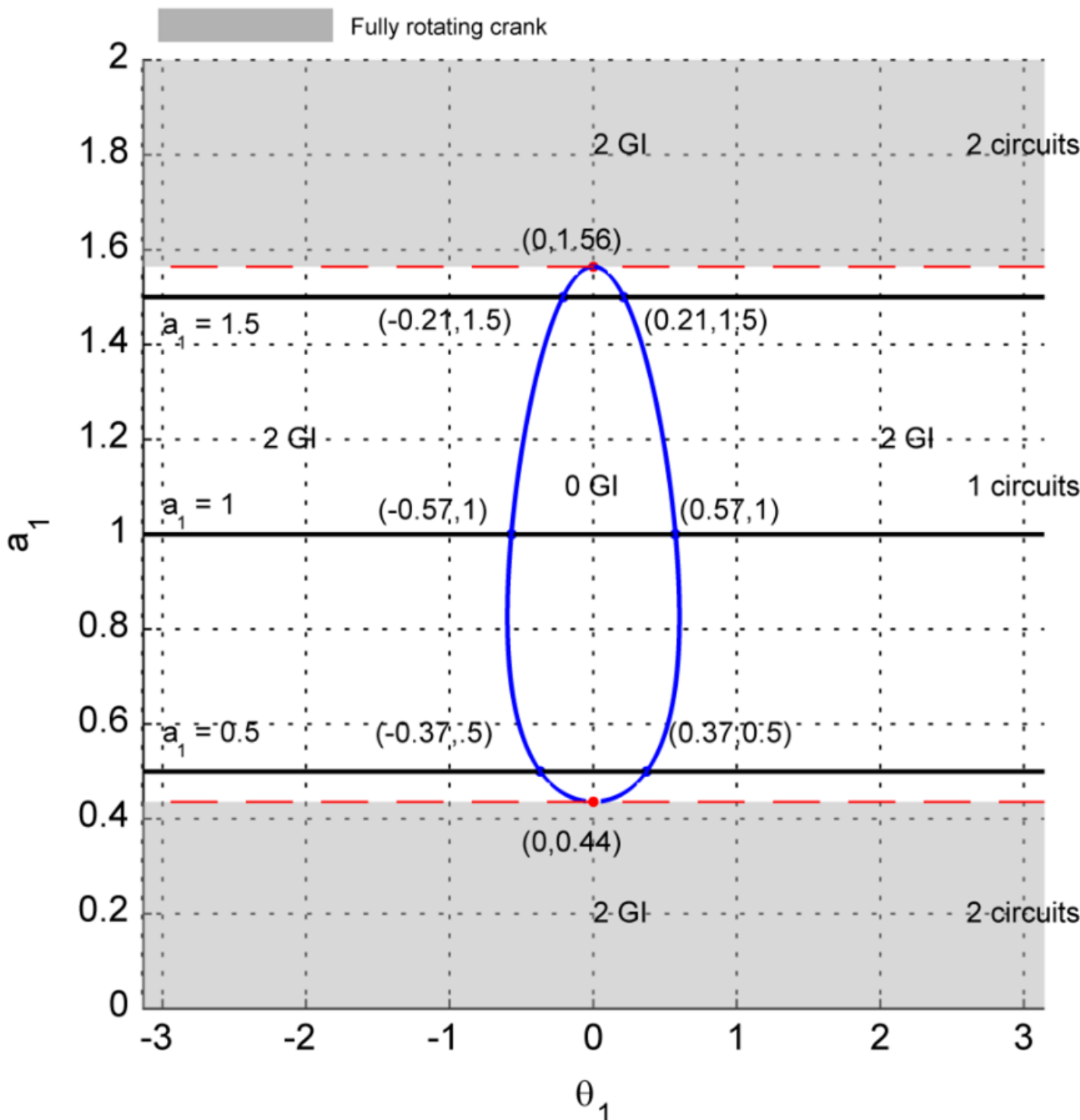
Future Goals

Generating singularity traces for spatial mechanisms

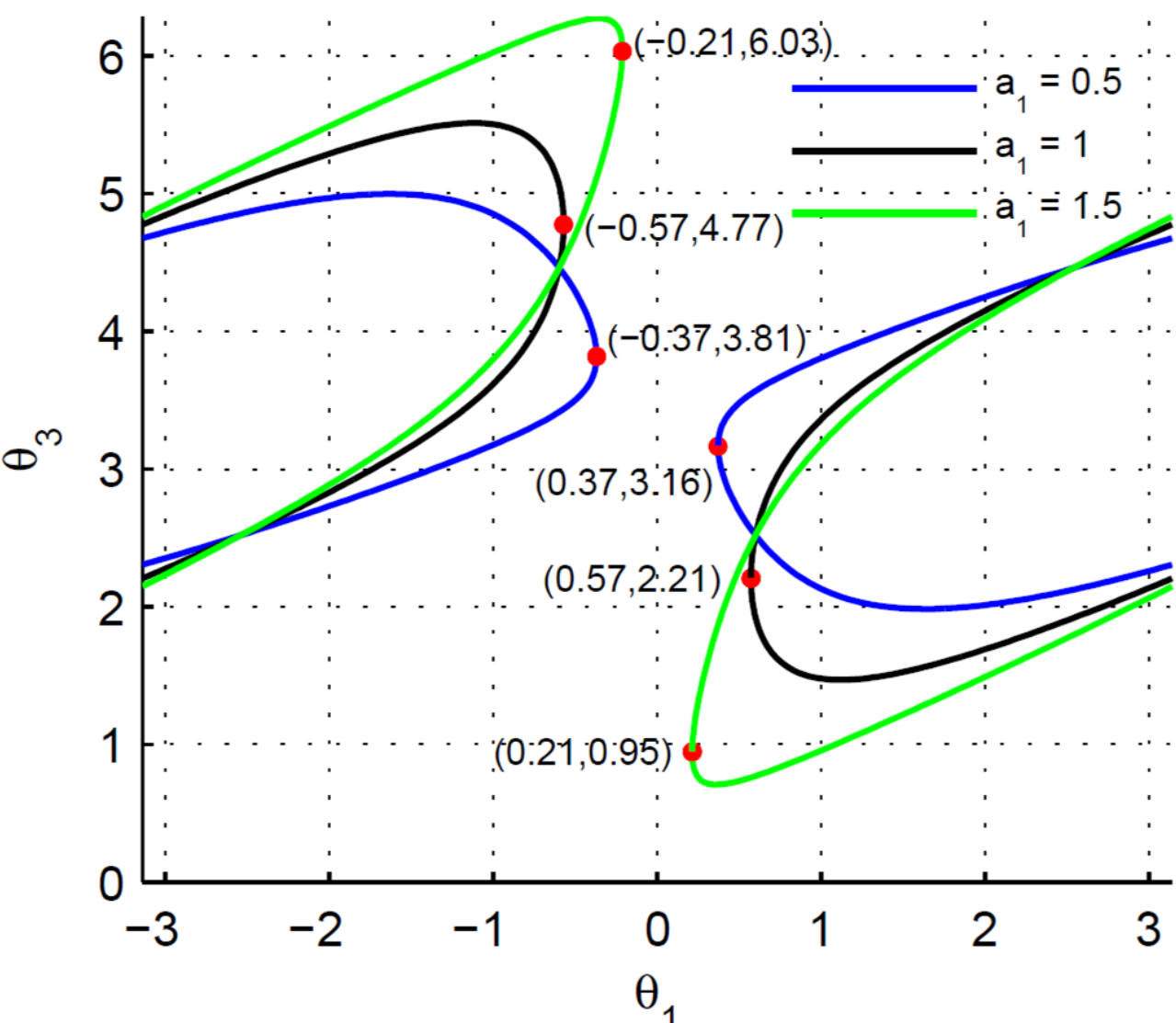
Inverted Slider-Crank Mechanism



Inverted slider crank mechanism position vector loop

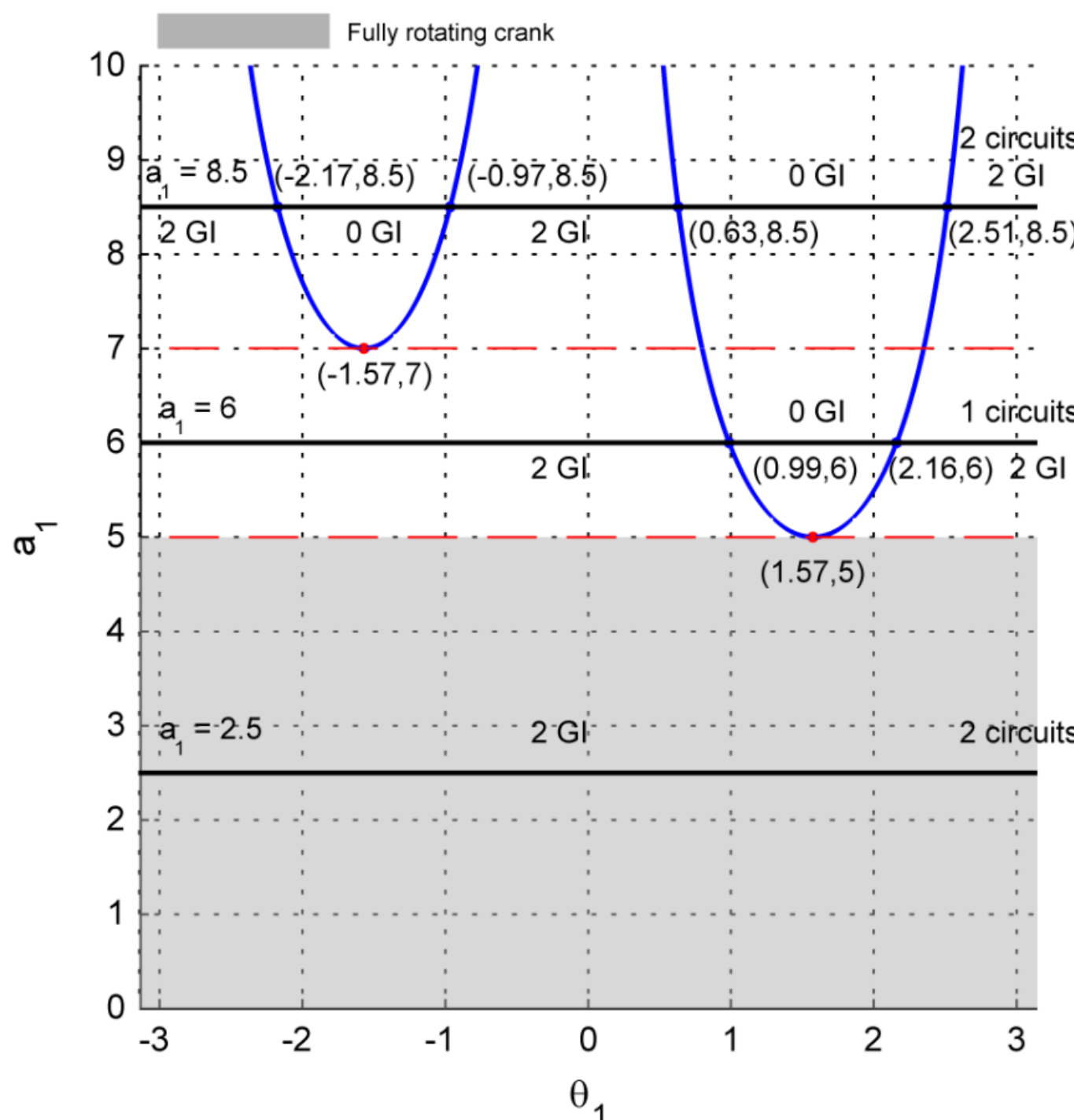


Inverted Slider-crank singularity trace

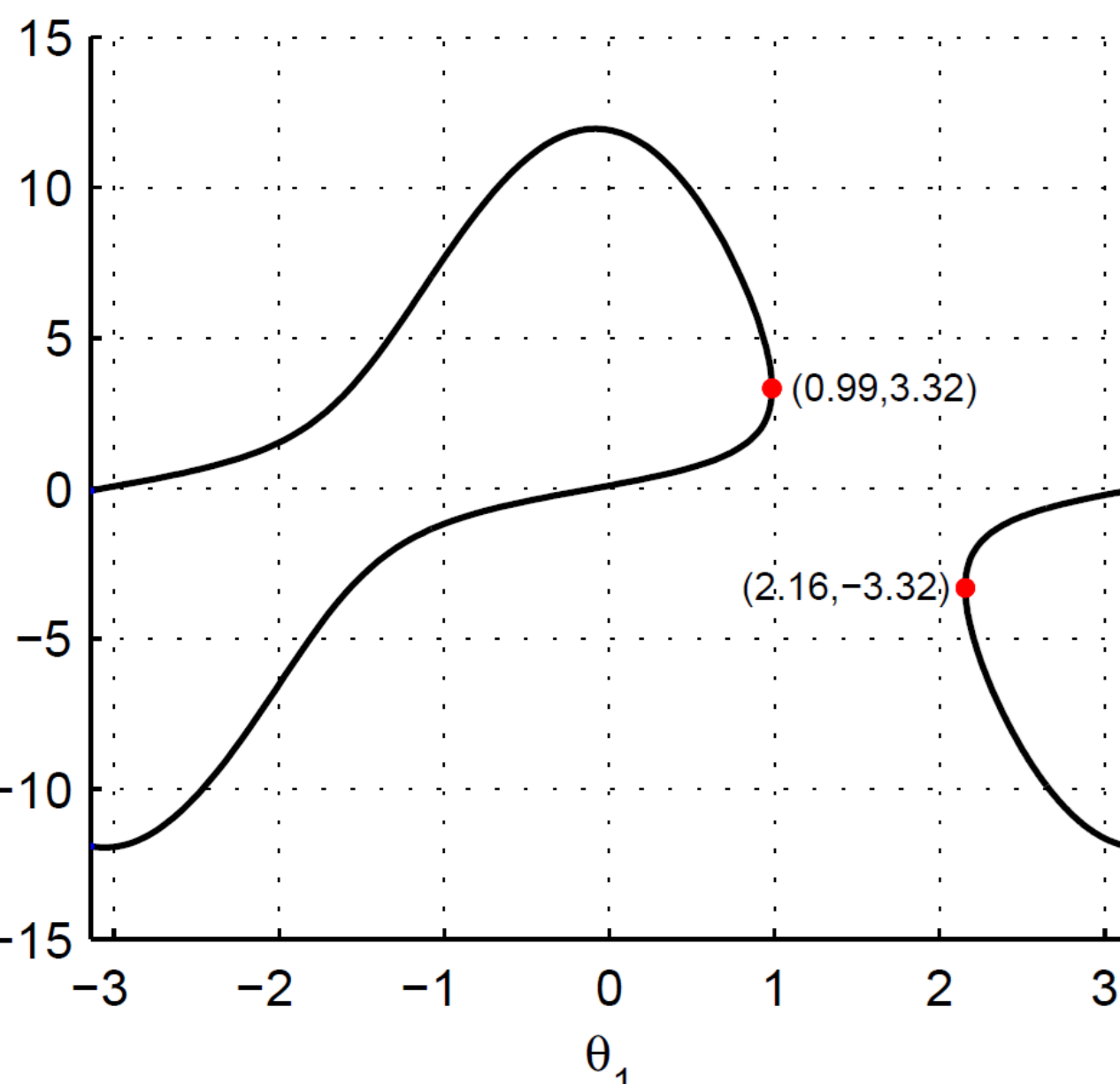


Motion curve at different length of a₁

Slider-crank at a critical point

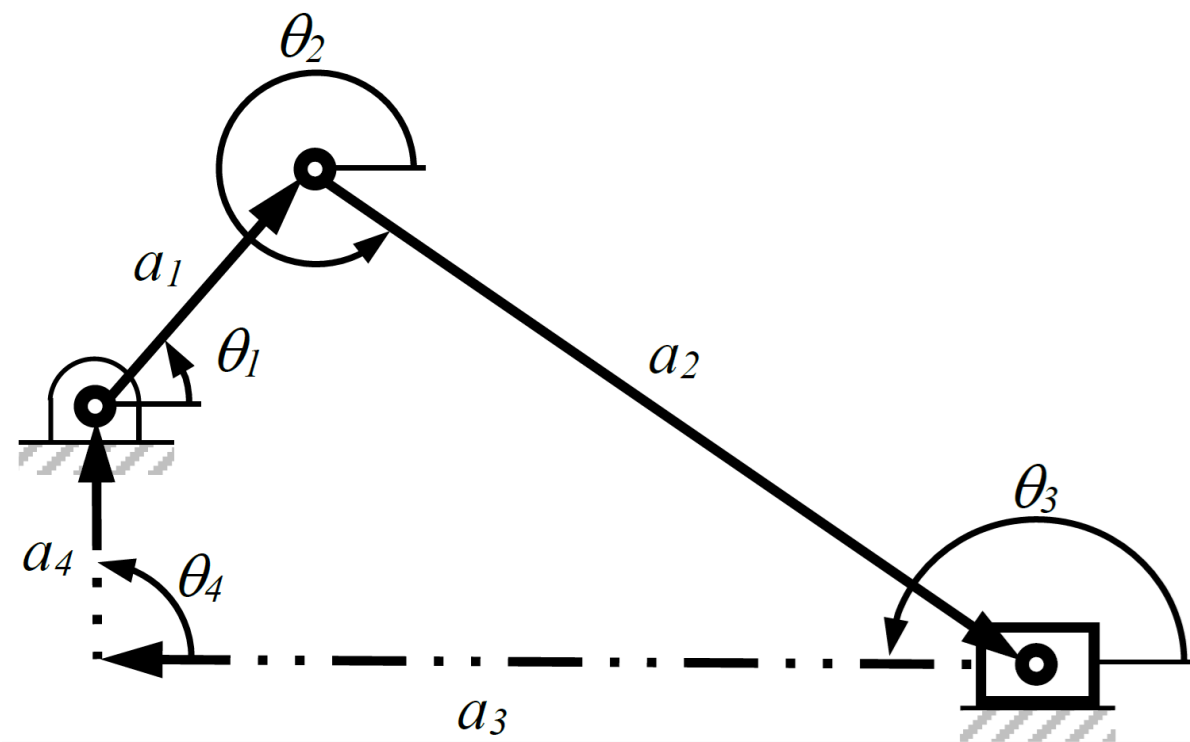


Slider-crank singularity trace

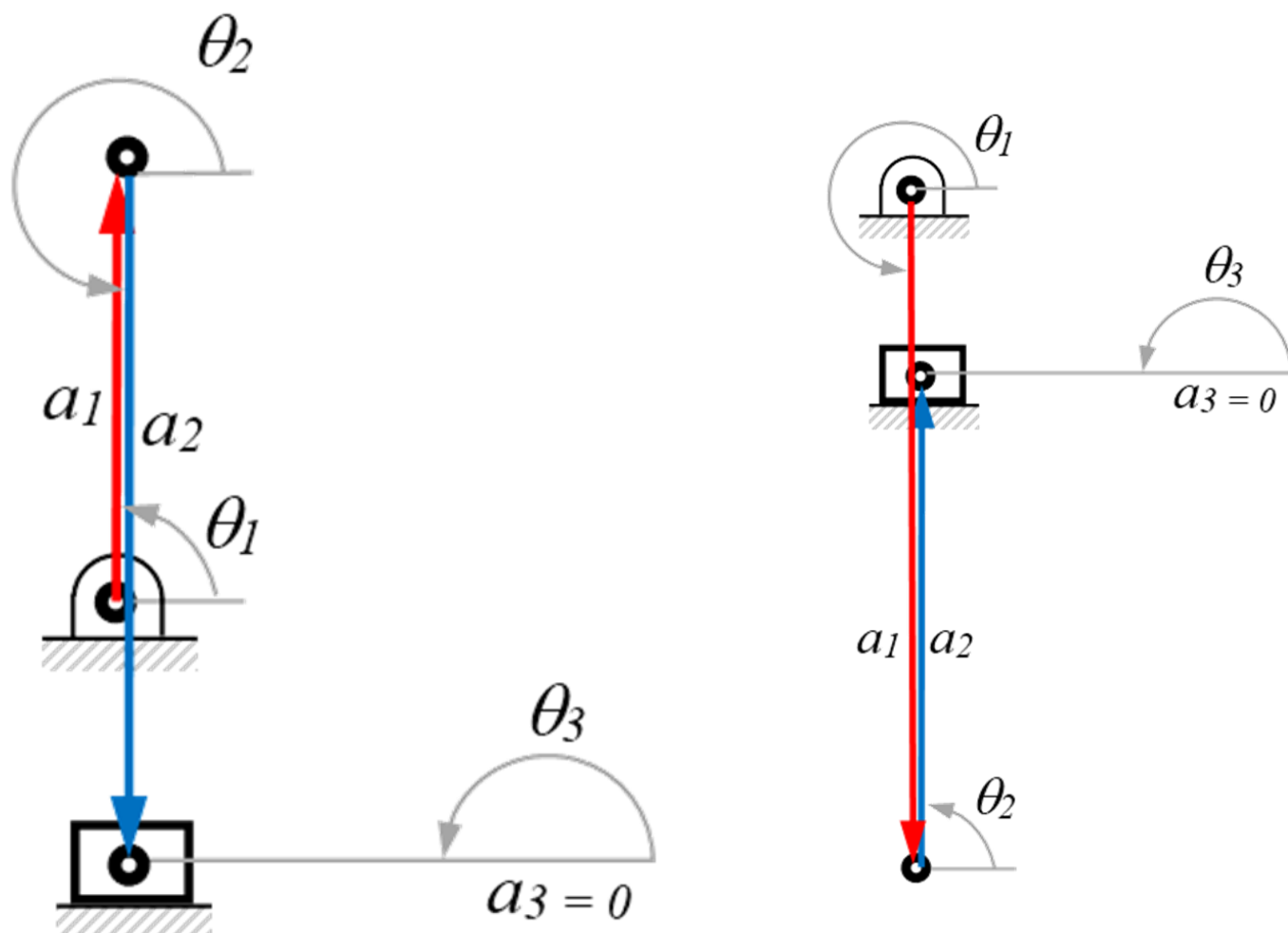


Motion curve at a₁ = 8.5

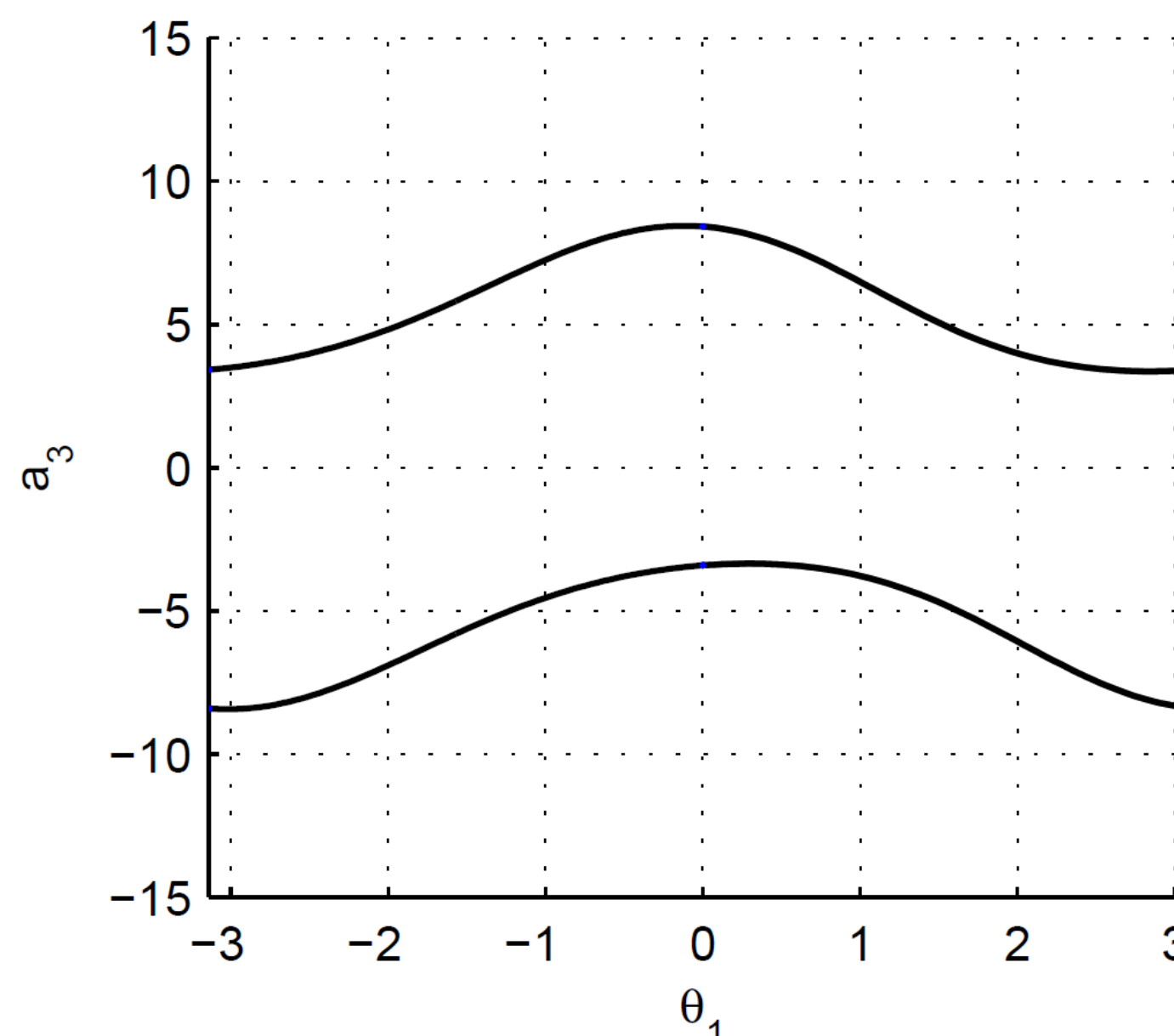
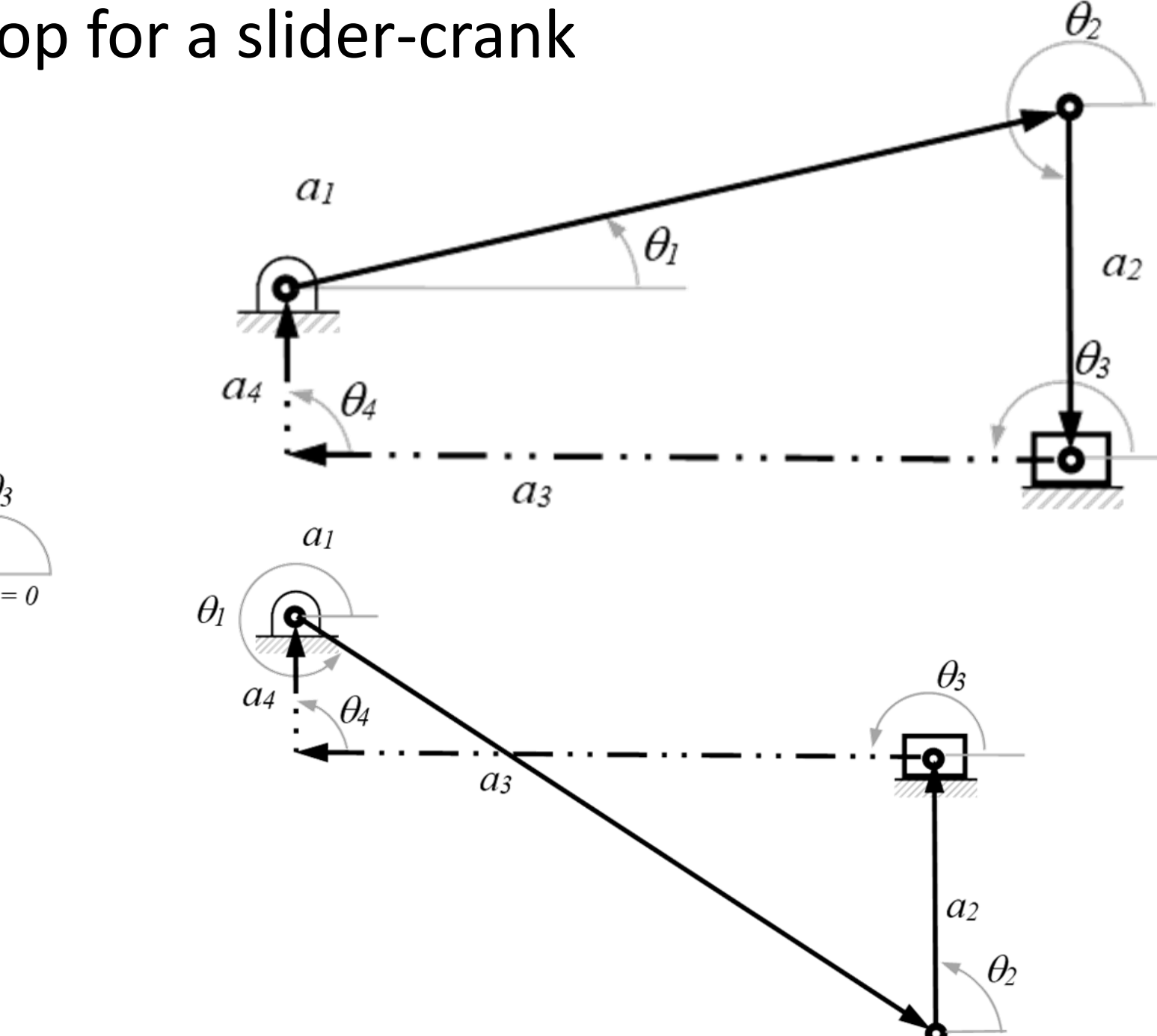
Slider-Crank Mechanism



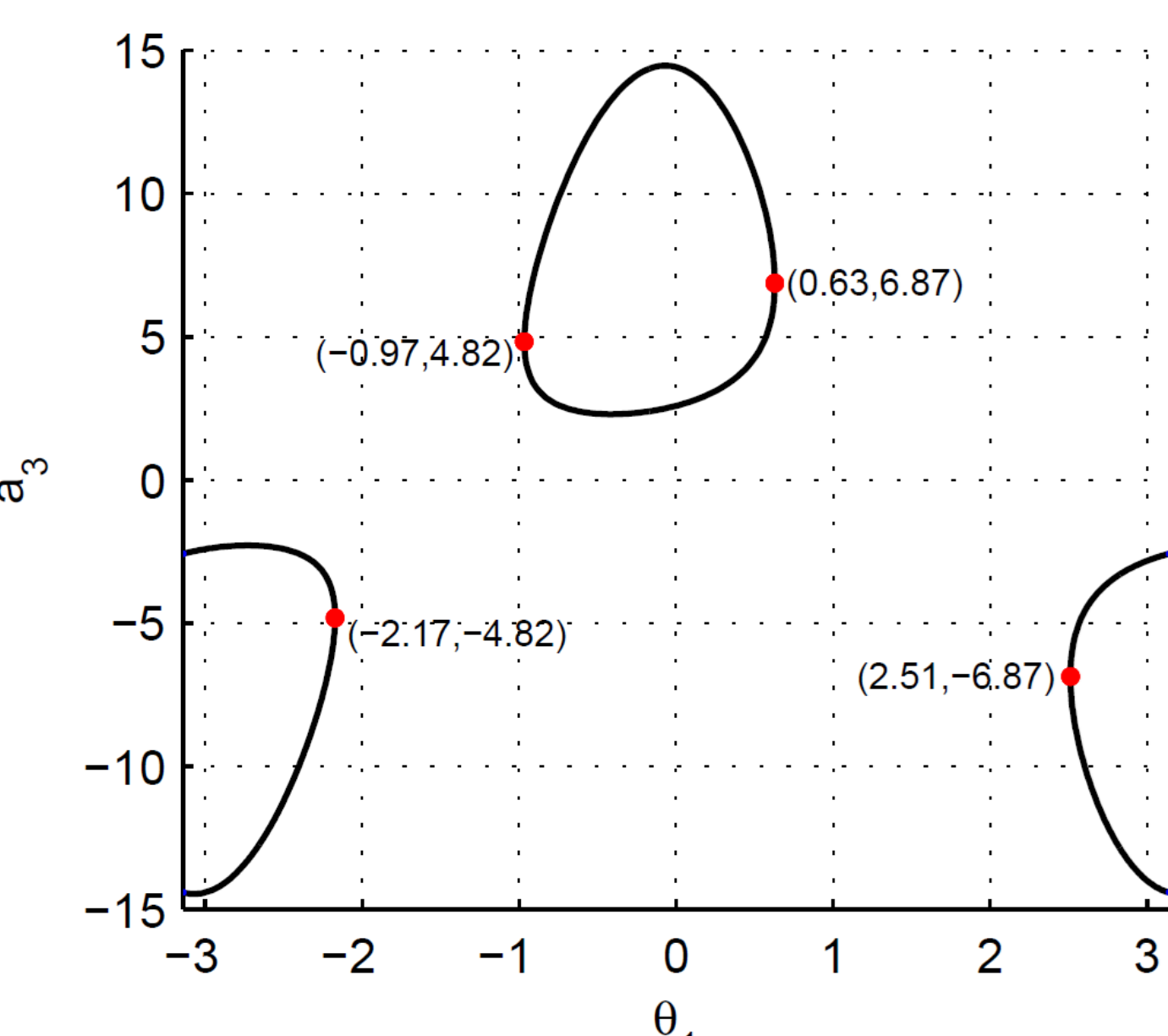
Position vector loop for a slider-crank



Slider-crank at a singularity

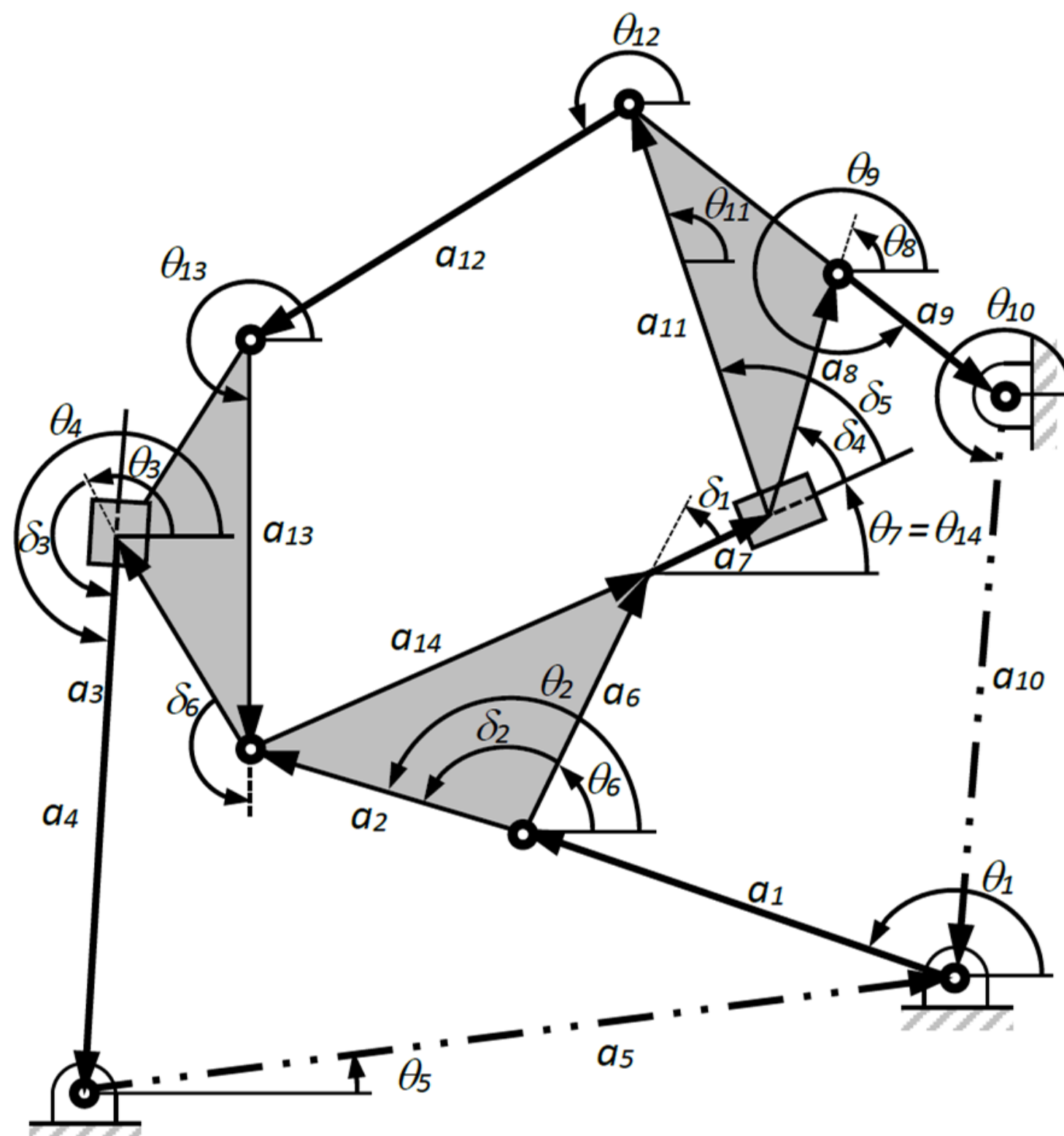


Motion curve at a₁ = 2.5

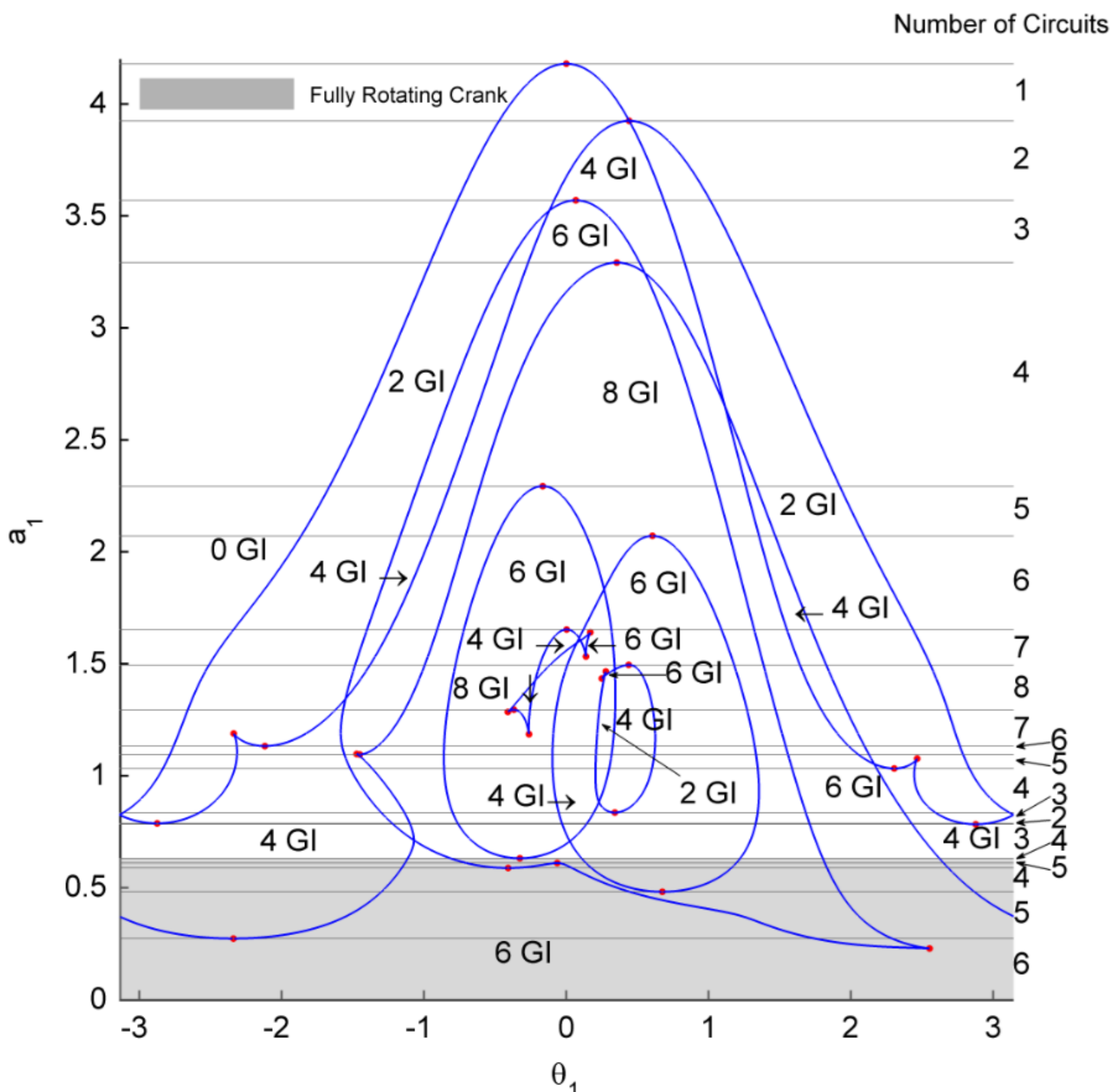


Motion curve at a₁ = 6

Assur IV/3 Mechanism

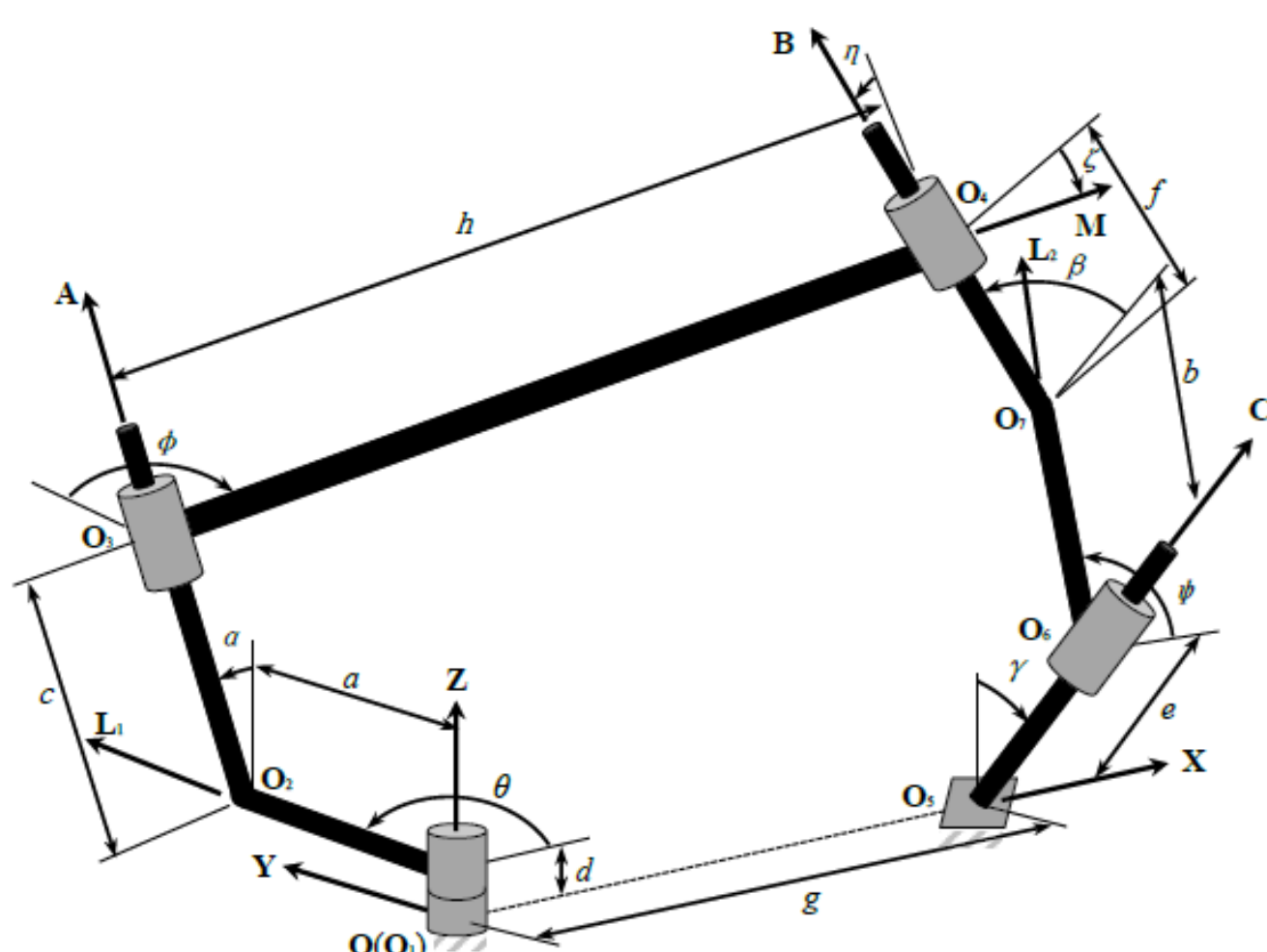


Assur IV/3 linkage position vector loop

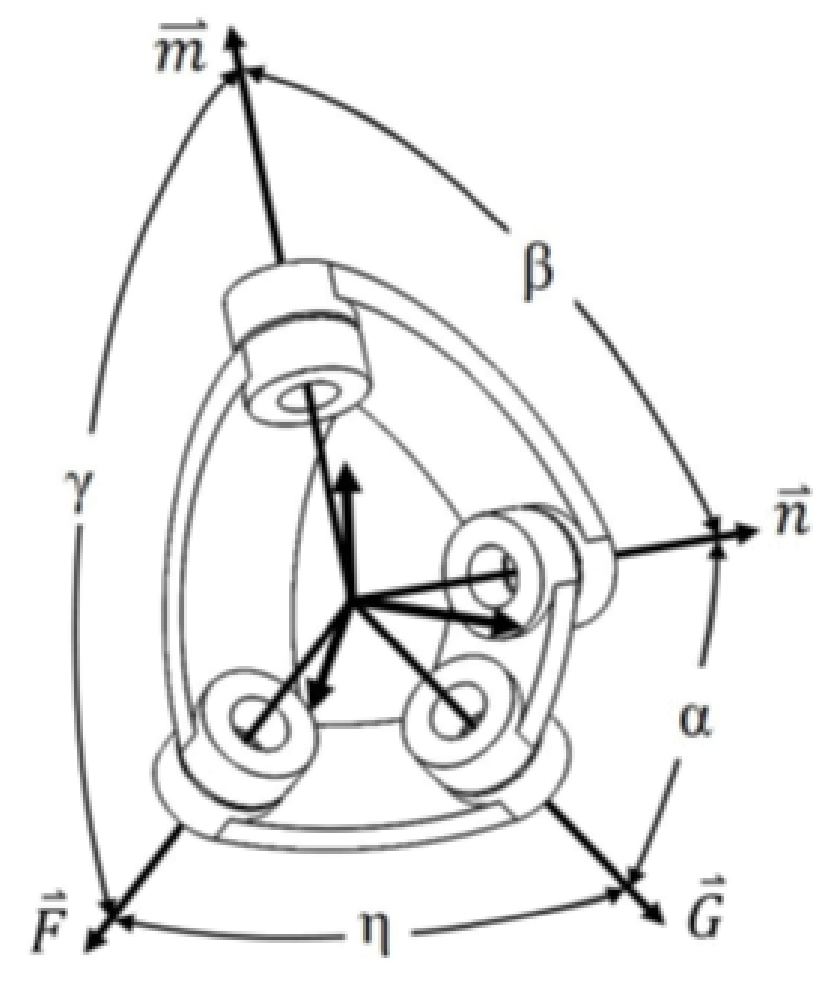


Assur IV/3 singularity trace

Spatial Mechanism



RCCC linkage



Spherical four bar mechanism