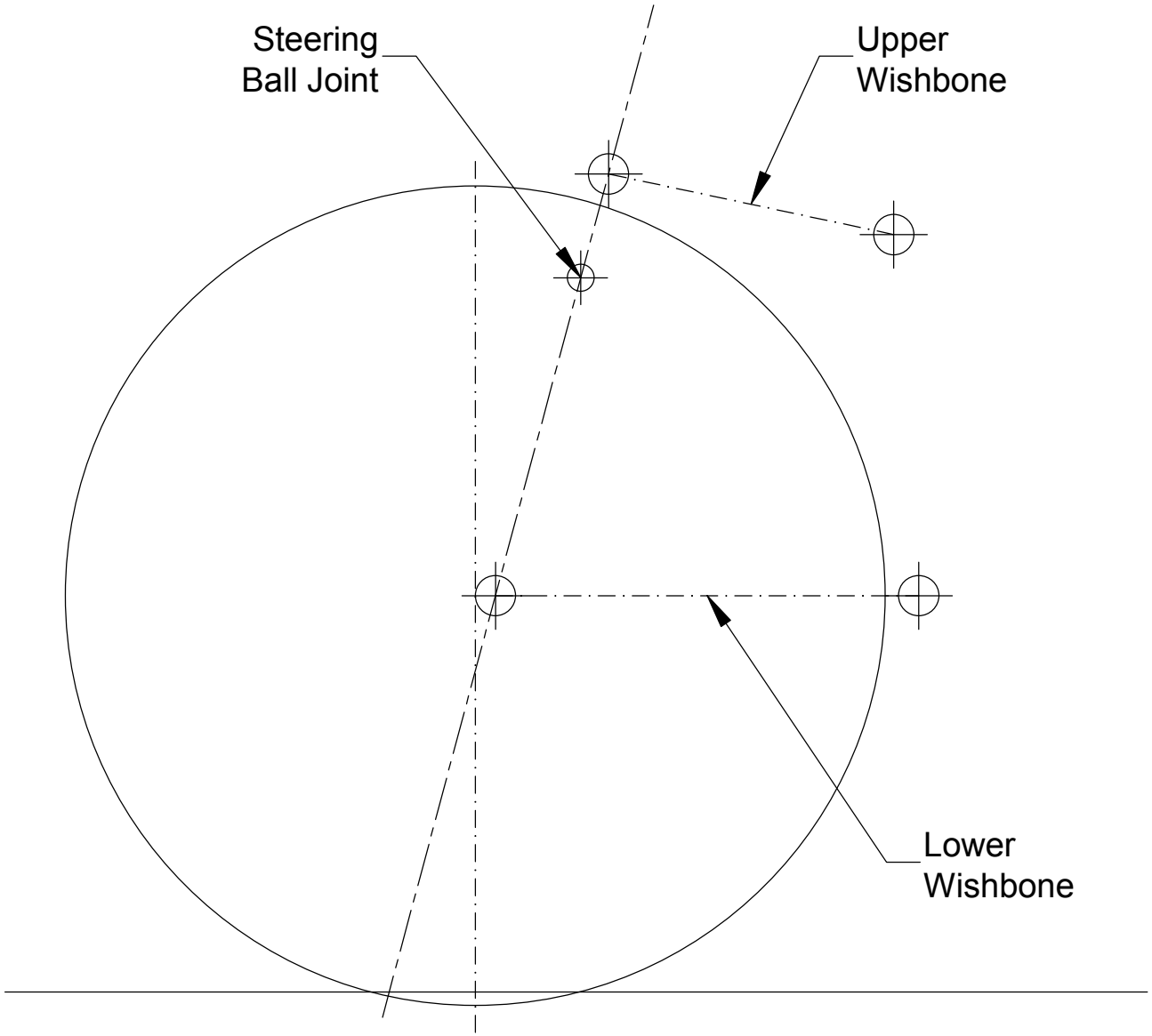
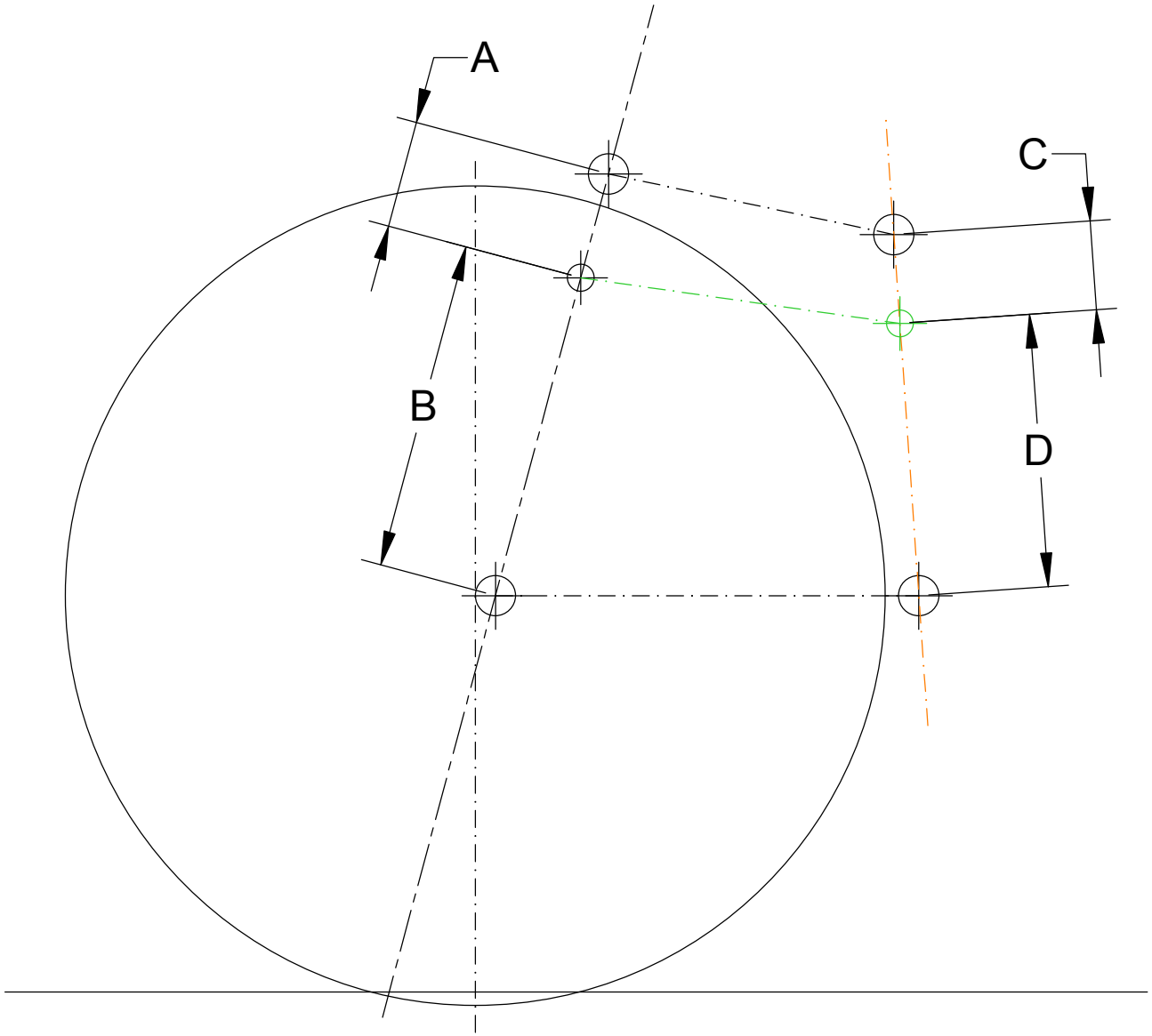
Motorcycle Front Suspension Steering Geometry



This diagram shows the general front suspension layout used in these notes. The steering ball joint on upright is an arbitrary distance along the axis between the upper and lower suspension ball joints.

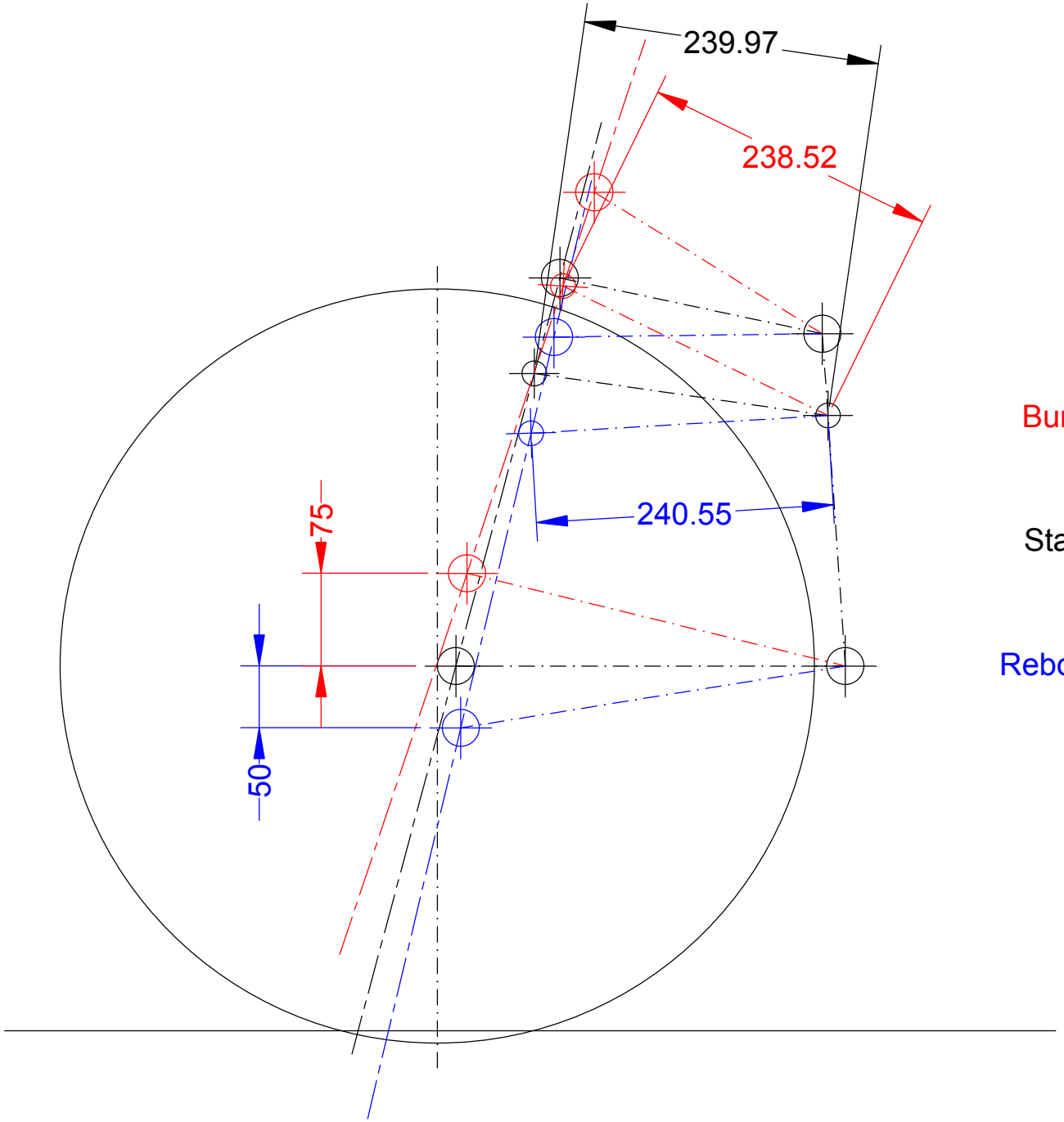
The best steering arrangement is to make steering link line up with top wishbone - which guarantees no bump steer, but can be difficult to arrange.

Method 1



Site the chassis end of the steering link on a line between the upper and lower wishbone pivots. The vertical position is given by:

$$A/B = C/D$$

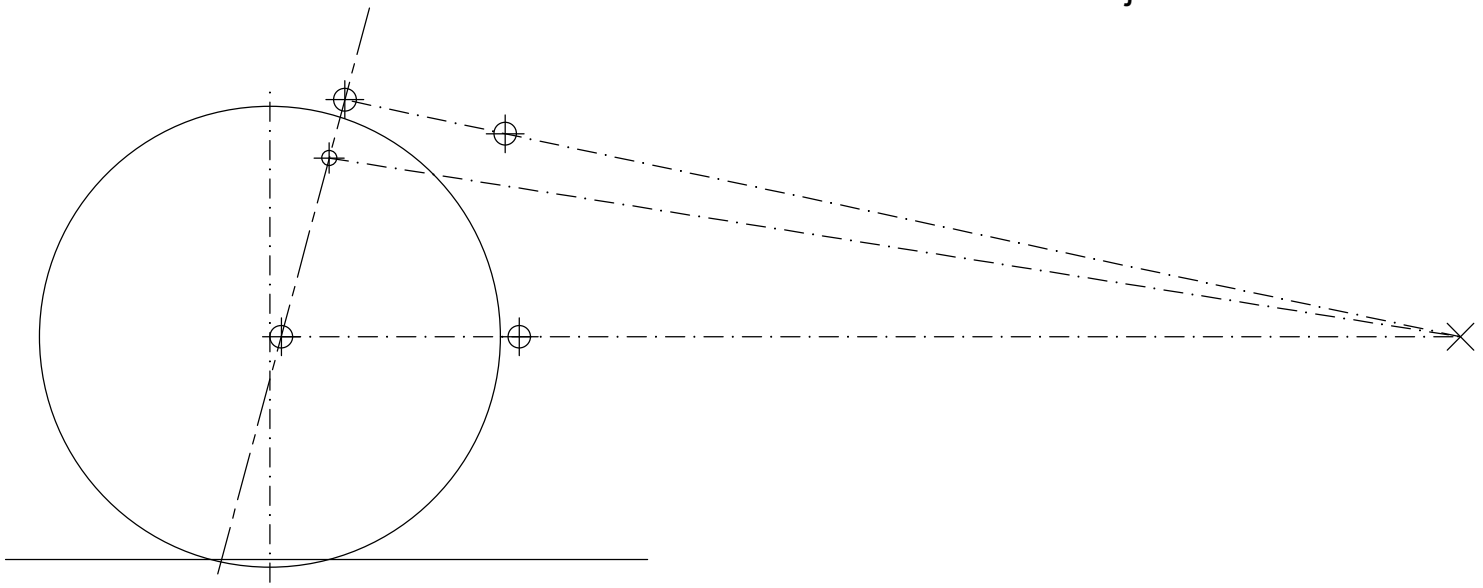


Method 1 Results

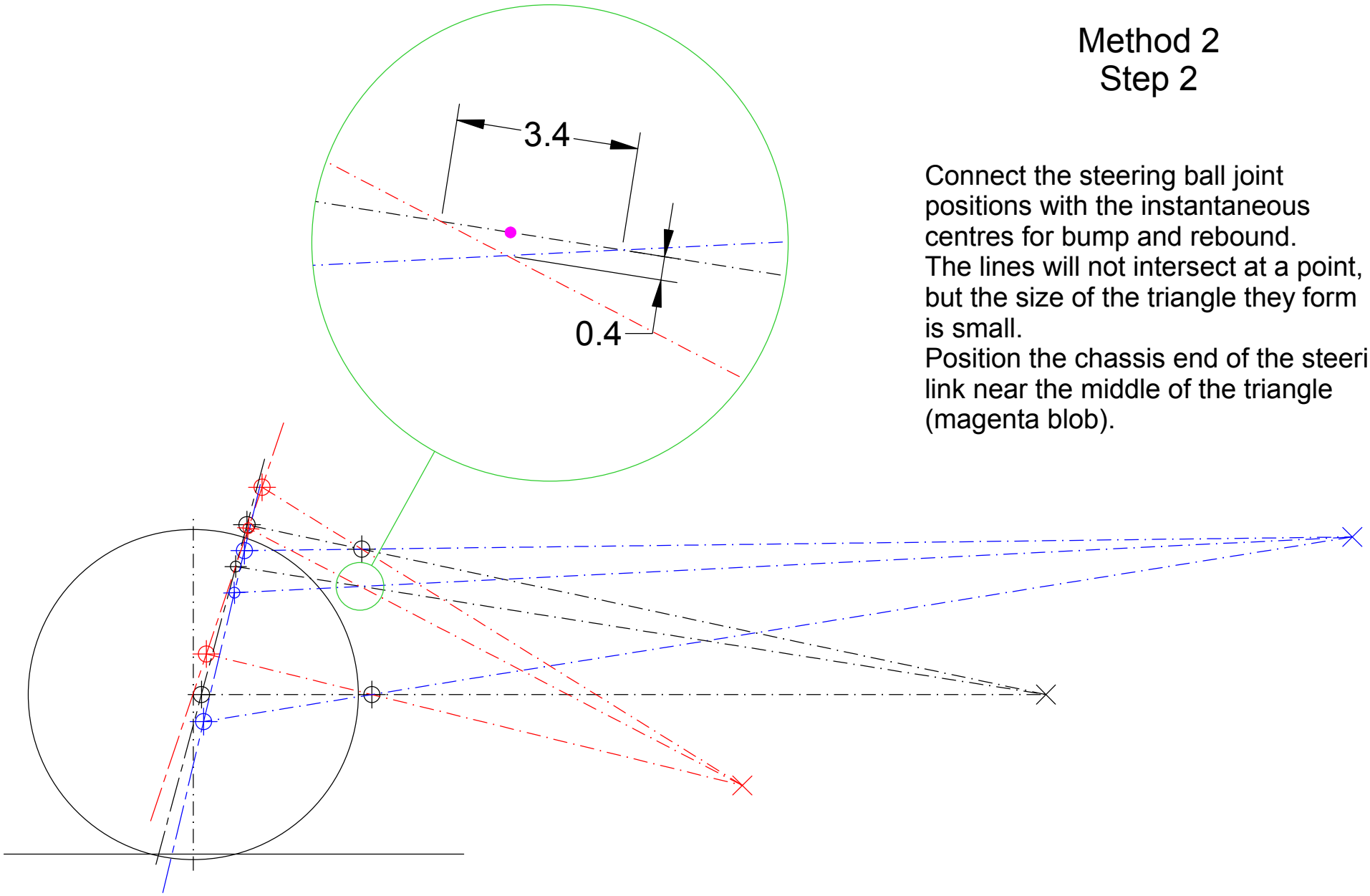
	Link length mm	Change mm
Bump	238.52	
		-1.45
Static	239.97	
		+0.58
Rebound	240.55	

Method 2
Step 1

Extend the wishbone axes until they intersect. This gives the instantaneous centre of the suspension - the suspension behaves as a leading arm pivoting about the instantaneous centre.
In this method, the chassis end of steering link should lie on the line connecting the steering ball joint with the instantaneous centre.

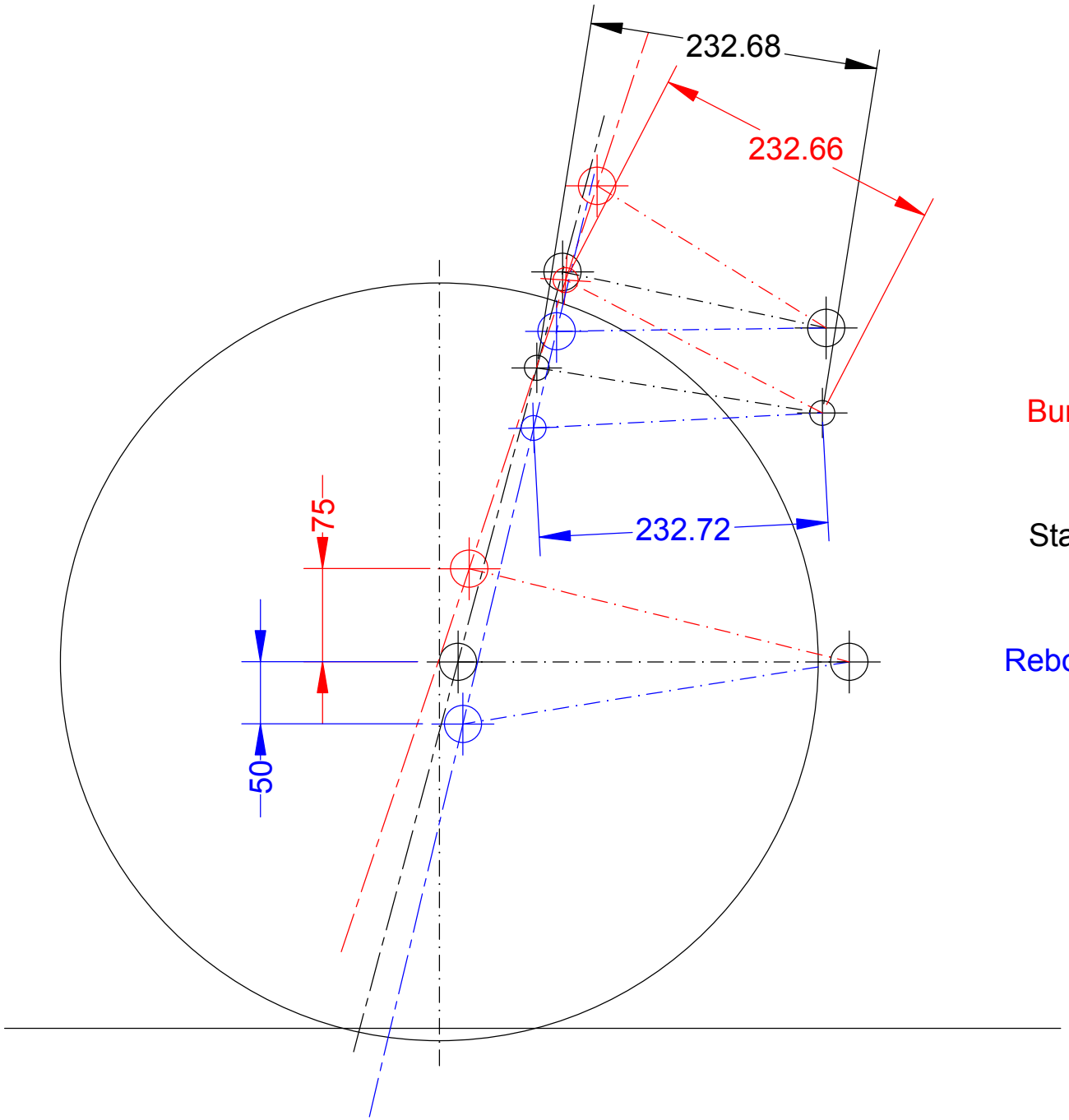


Instantaneous Centre



Method 2
Step 2

Connect the steering ball joint positions with the instantaneous centres for bump and rebound.
The lines will not intersect at a point, but the size of the triangle they form is small.
Position the chassis end of the steering link near the middle of the triangle (magenta blob).



Method 2 Results

	Link length mm	Change mm
Bump	232.66	
		-0.02
Static	232.68	
		+0.06
Rebound	232.72	