Slide crank – Scotch yoke comparison

Objective
In the following assignment you are required to compare the dynamics of a Slider crank mechanism with that of a Scotch yoke mechanism.

Background
A scotch yoke mechanism is one which translates rotary to linear movement or vice versa, by using a pin moving in a slot.

A slider crank is a mechanism is one which translates linear to rotary movement using an oscillating link or con-rod.

The scotch yoke mechanism produces perfect simple harmonic motion e.g. a sin wave. Because velocity and acceleration are the derivative of the displacement time curve these graphs also have a perfect wave form.

The slider crank mechanism produces movement which is a slight distortion of perfect simple harmonic motion. This is because of the effective reduction in the centre distances when measure axially when the con-rod is at an angle. There is a corresponding distortion of the velocity and acceleration graphs.

Instructions
Download (and assemble if necessary) the Slider crank and Scotch yoke mechanisms from S:\classes\sean dalton\Mechanisms. Mechanisms are located in ME3-Mechanisms.

Using a speed of 60rpm and a simulation time of 2 seconds simulate both mechanisms and generate both velocity and acceleration graphs. Export to Excel and amalgamate graphs of the same parameter.

Comment on your observations.

Deliverables
This ‘report’ should include:
- Objective
- Relevant graphs
- Discussion/conclusion

This should be limited to a single page or two pages at most.