

Cam and Rocker Assembly

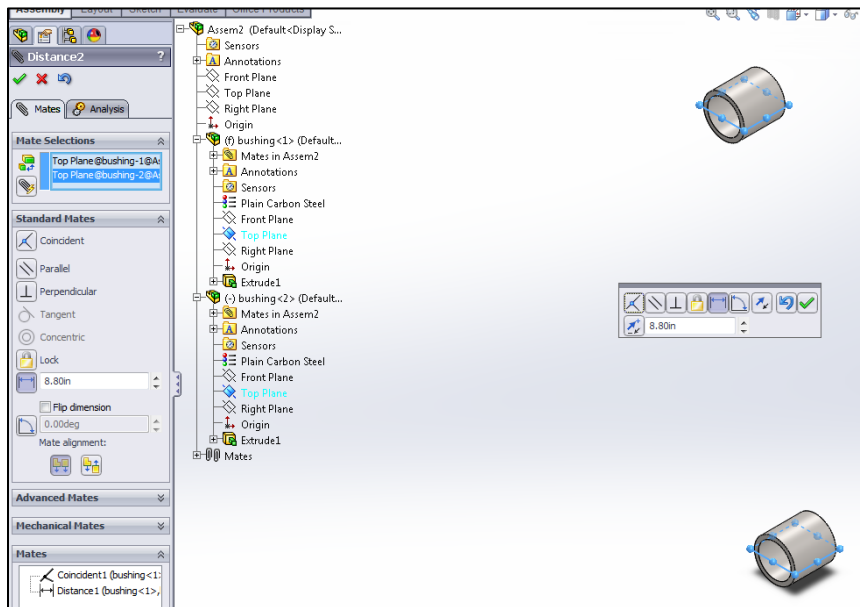
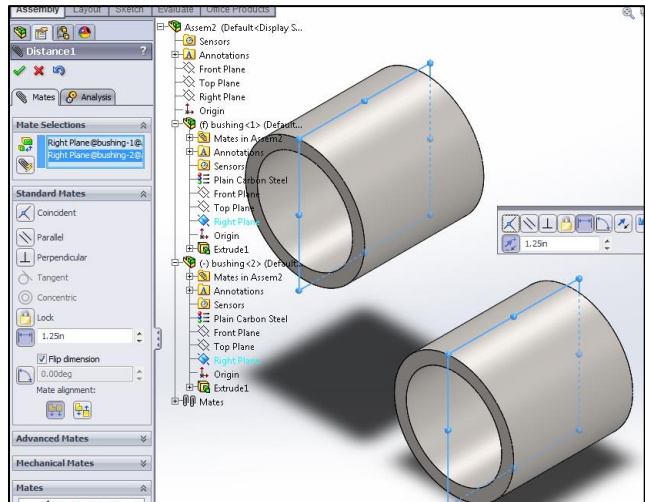
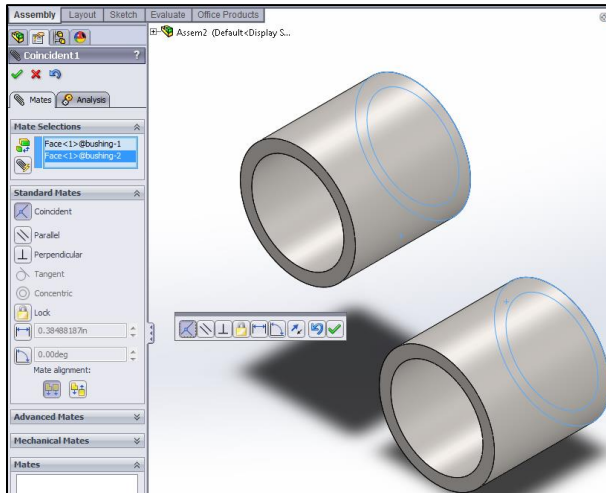


Goals:

- Complete the Assembly
- Create turning motor for cam and spring for valve
- Create Plot for angular velocity of the valve

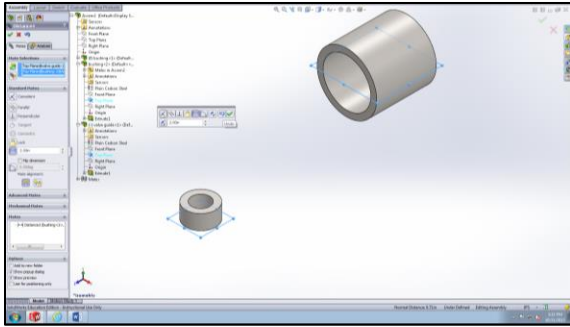
Begin by bringing in a 2 bushings. Make them coincident with their front planes(See bottom left). Then make a distance mate of 1.25 inches with their right planes (See bottom right).

Now make a distance mate between the two bushing's top planes of 8.8 inches

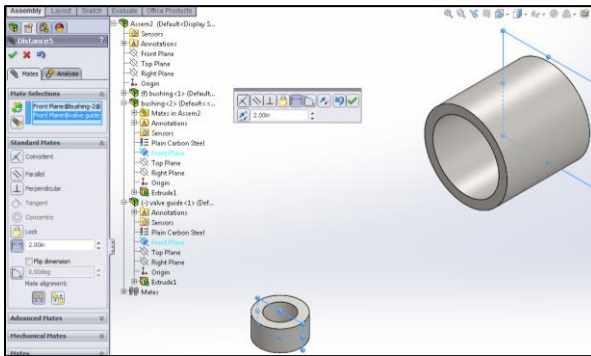


Bring a new component, the valve guide. Distance mate it to the top bushing with their right planes for 1.25 inches.

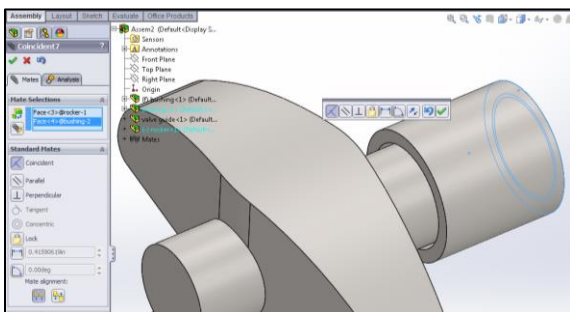
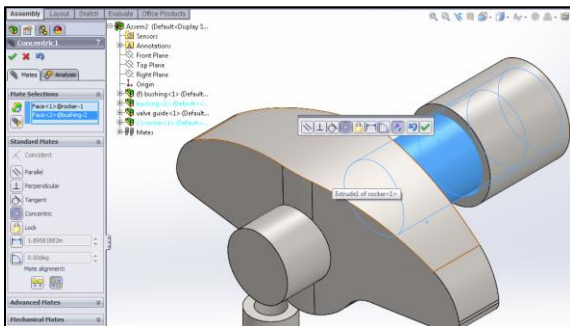
Now Distance mate their top planes by 2 inches



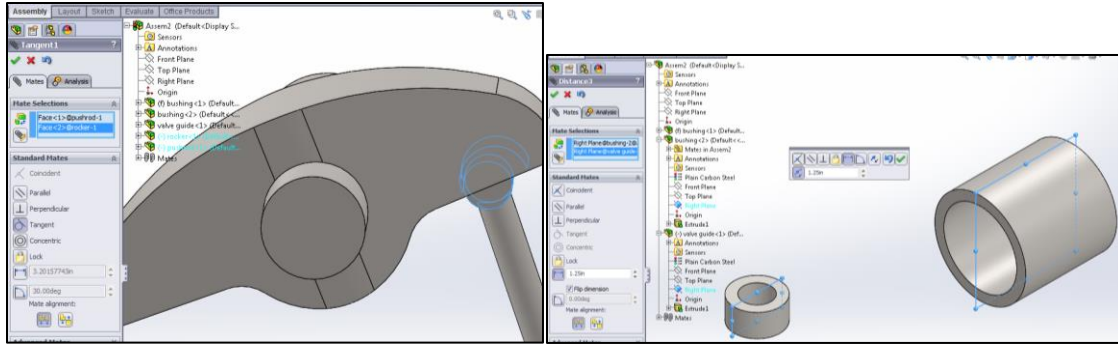
Now Distance mate their front plane by 2 inches



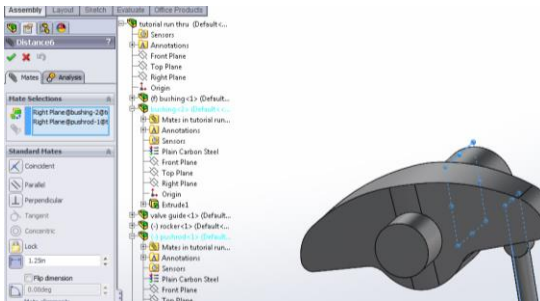
Insert the rocker and make a concentric and coincident mate with the top bushing (See below).



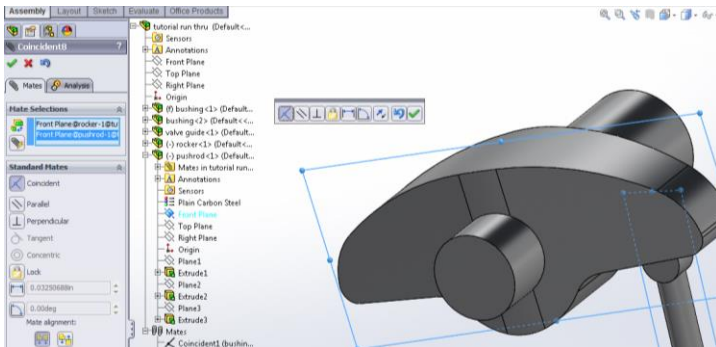
Insert the pushrod component and make a tangent mate between the rocker and pushrod. THIS STEP IS VITAL, DO



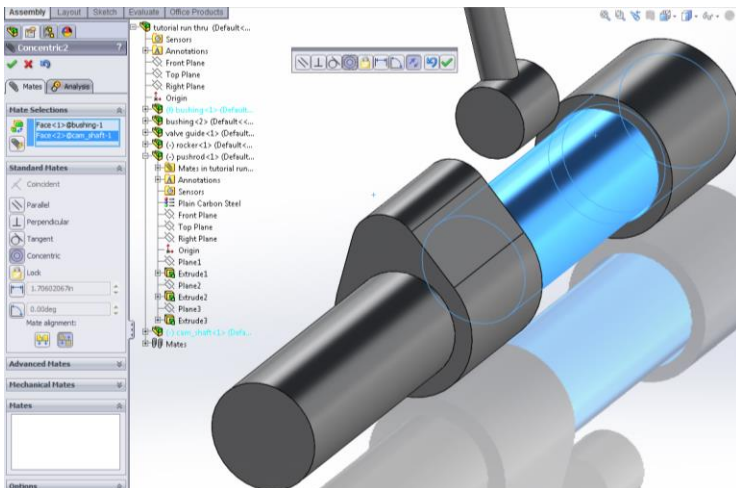
Make a distance mate of 1.25in between the right planes of pushrod and top bushing.



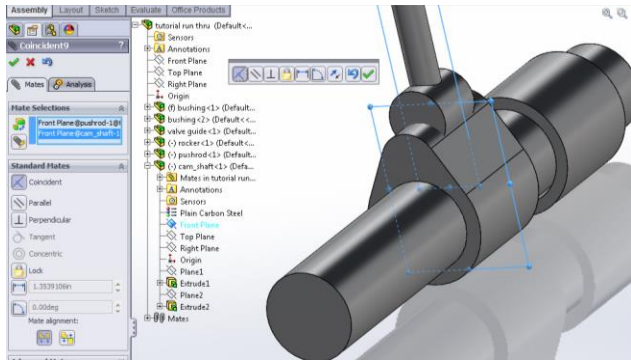
Make the pushrod and rocker front planes coincident.



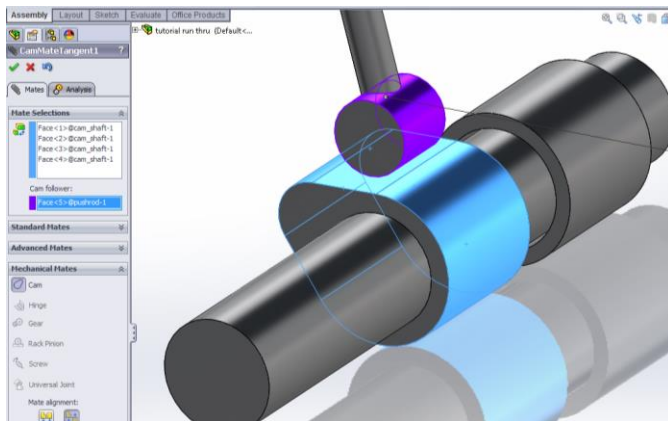
Insert camshaft and mate it coincident to the bottom bushing



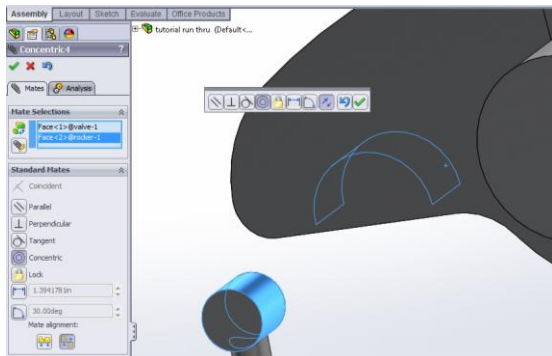
Coincident mate the front plane of the pushrod with the front plane of the camshaft



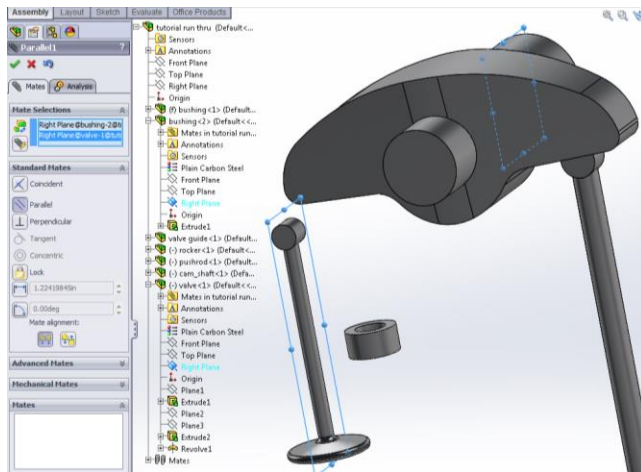
Now as you can see the pushrod and camshaft overlap, we need to use a mechanical mate and select the cam option.



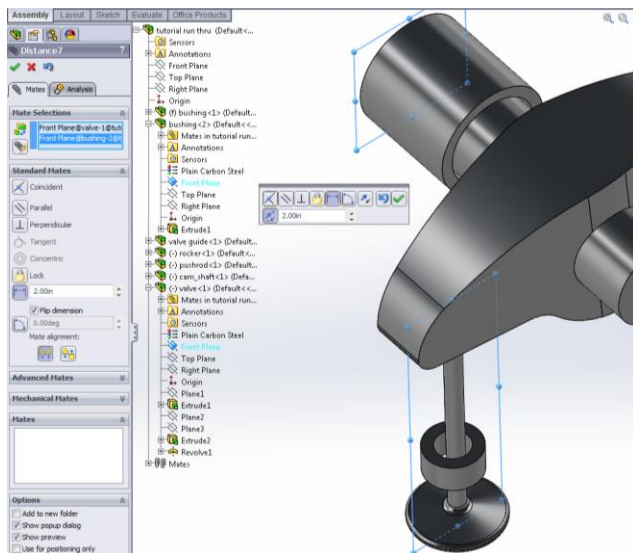
The next mate requires we bring in the valve component, mate it concentrically with the rocker as seen below.



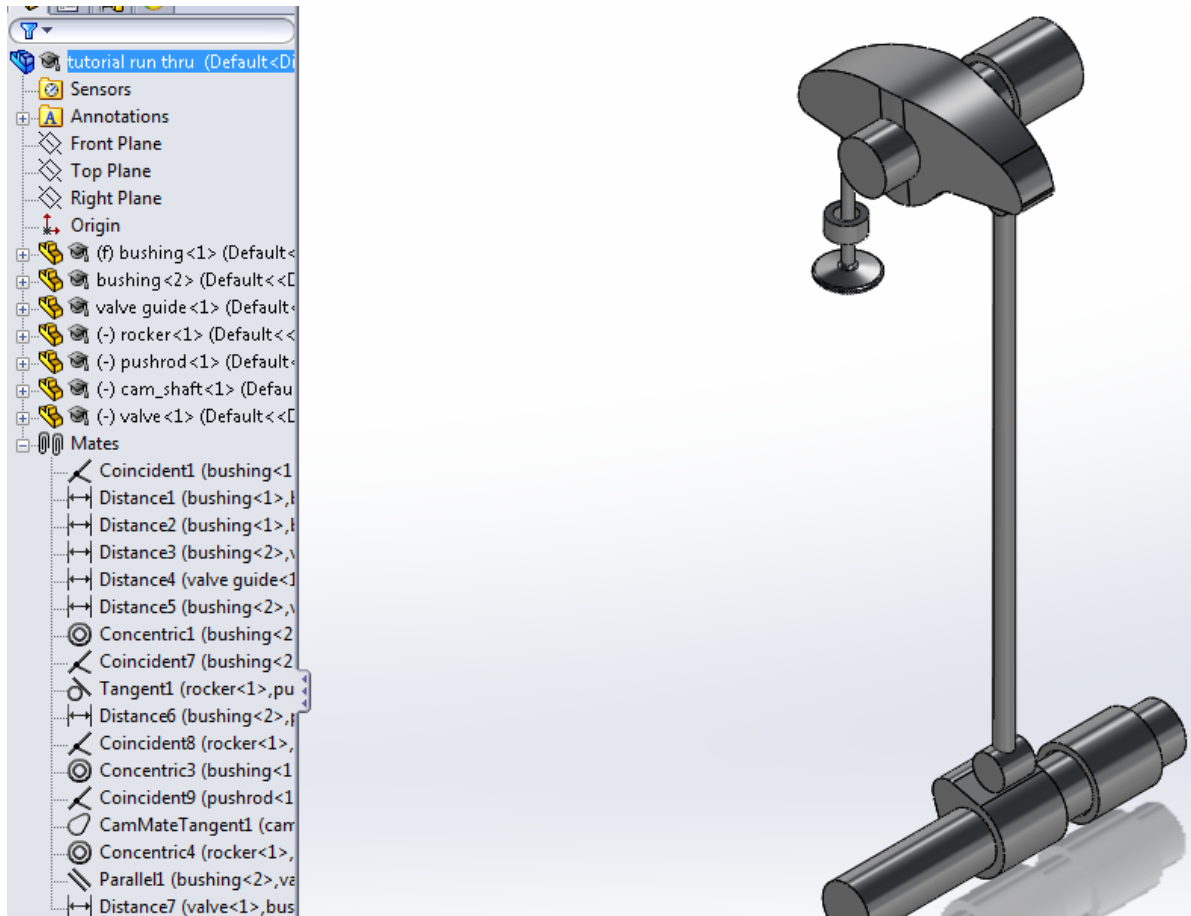
Now make a parallel mate with the right planes of the valve and the top bushing.



Make a 2 in Distance mate with front plane of the top bushing and the valve.

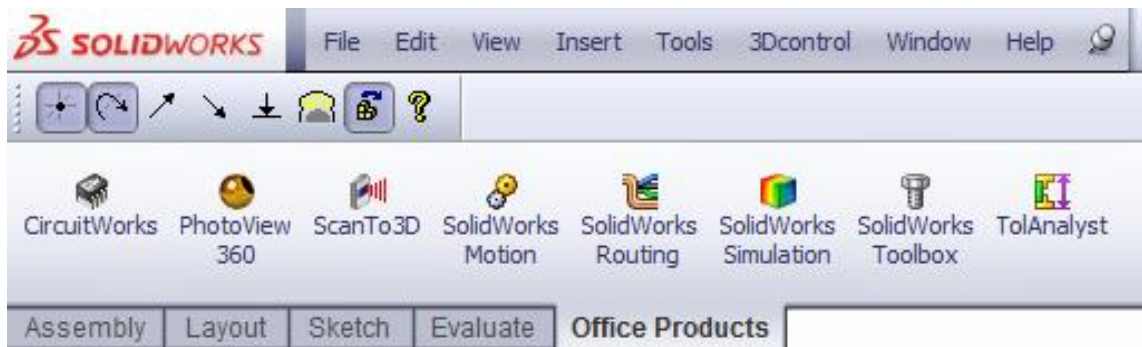


The mates are now complete, your model and mates tree should look like this (see Below)

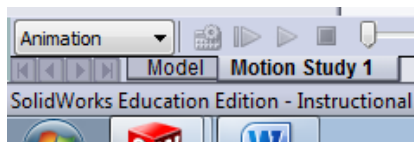


Making Turning Motor for cam

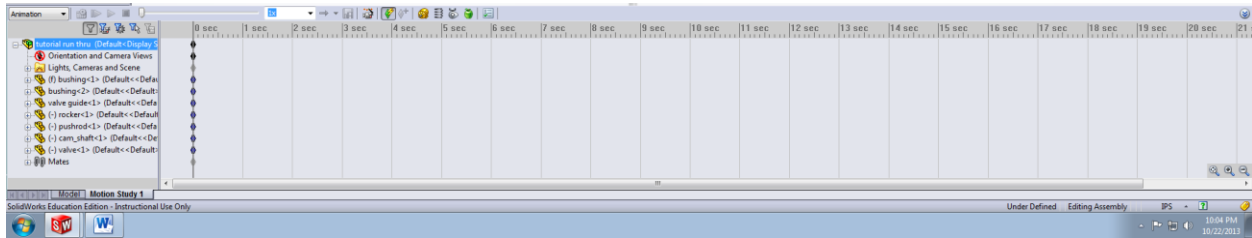
-Star by selecting the Motion study button from the top menu. Certain buttons needed later will not appear unless this is selected.



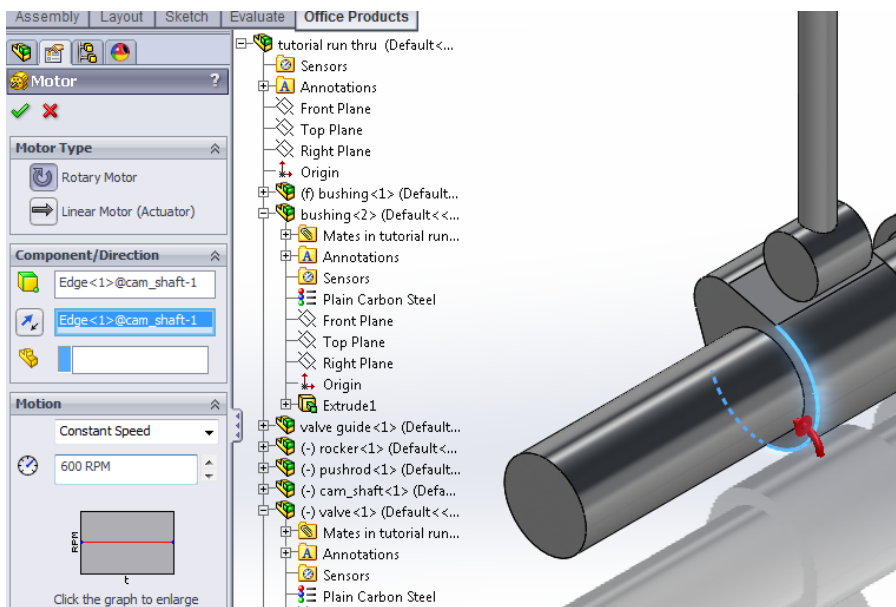
Now select the motion study tab at the bottom of the screen



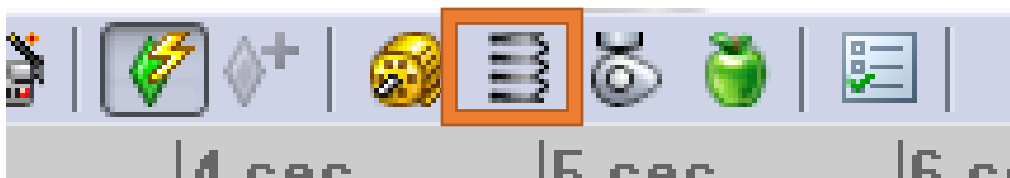
A menu will pop up that looks like this.



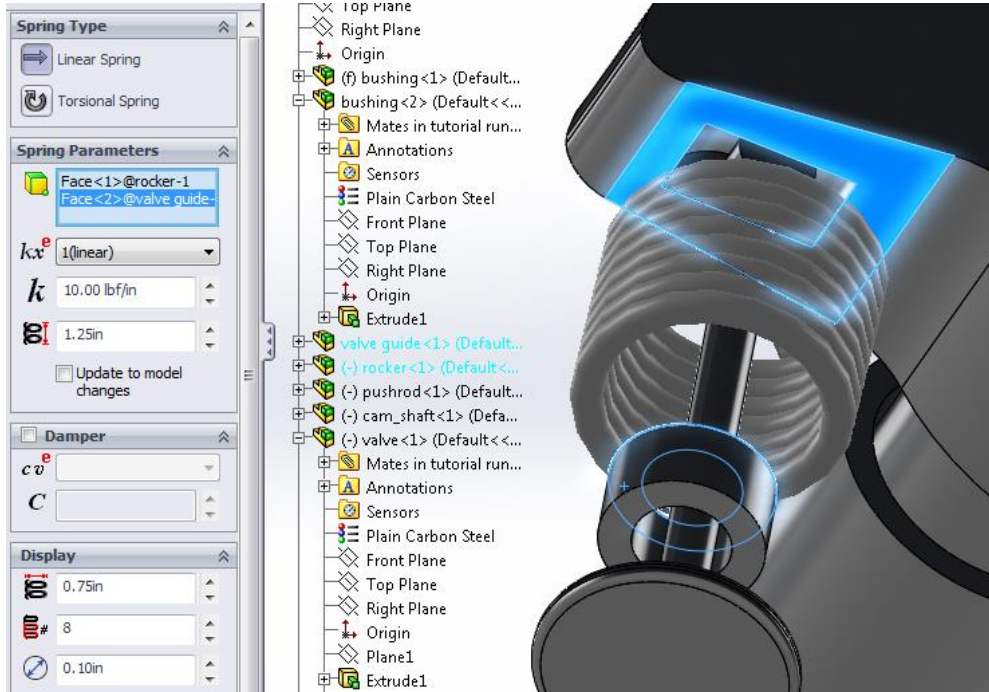
Select the motor button and then the circular portion of the cam. Set the Motion to 600 rpm as seen below.



Now select the spring button



Once you select the spring option, select the top of the valve guide and bottom of the rocker as the boundaries for the spring. In the menu for Spring Details, set the stiffness to 10, length 1.25 in, Coil Diameter to .75in, Number of coils 8, and wire diameter to .1 in.

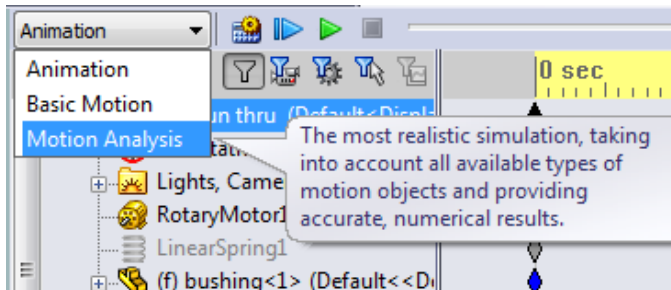


Click Okay and hit the recalculate button, you'll see the assembly's movement takes into account the motor and the spring.



Plotting Angular Velocity of Cam

First Switch the Animation option from Animation to Motion Analysis



Now in the motion tree on the bottom left, right click on the valve. Click the option Create Motion Plot.

Fill under the result tab the details as seen below.

