

Stevens Institute of Technology
ME345 Modeling and Simulation – Prof. Frank Fisher

Toggle Press Tutorial

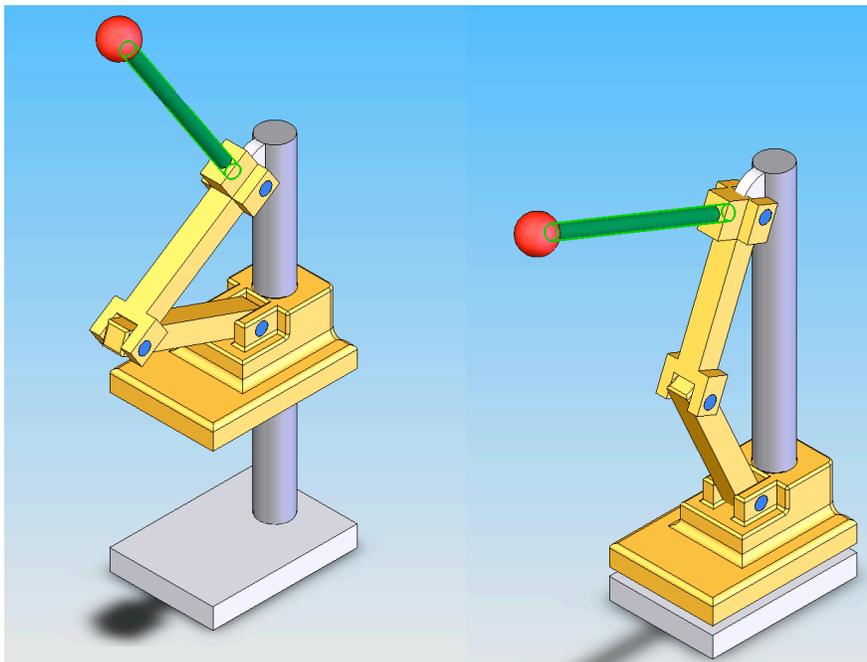
Last updated September 15th, 2015 – Ryan Oldja

Objective: Using SolidWorks, assemble the toggle press as shown. The assembly functions as a four bar mechanism, where the upper base part presses towards the lower base as the toggle handle is rotated downward.

Part List and Quantity: Extract the press parts from the togglepress1.zip folder. The assembly will require one of each piece and 3 pins.

Part	Quantity
handle.SLDPRT	1
link1.SLDPRT	1
link2.SLDPRT	1
lowerbase.SLDPRT	1
pin2.SLDPRT	3
upperbase.SLDPRT	1
Verticalsupport.SLDPRT	1

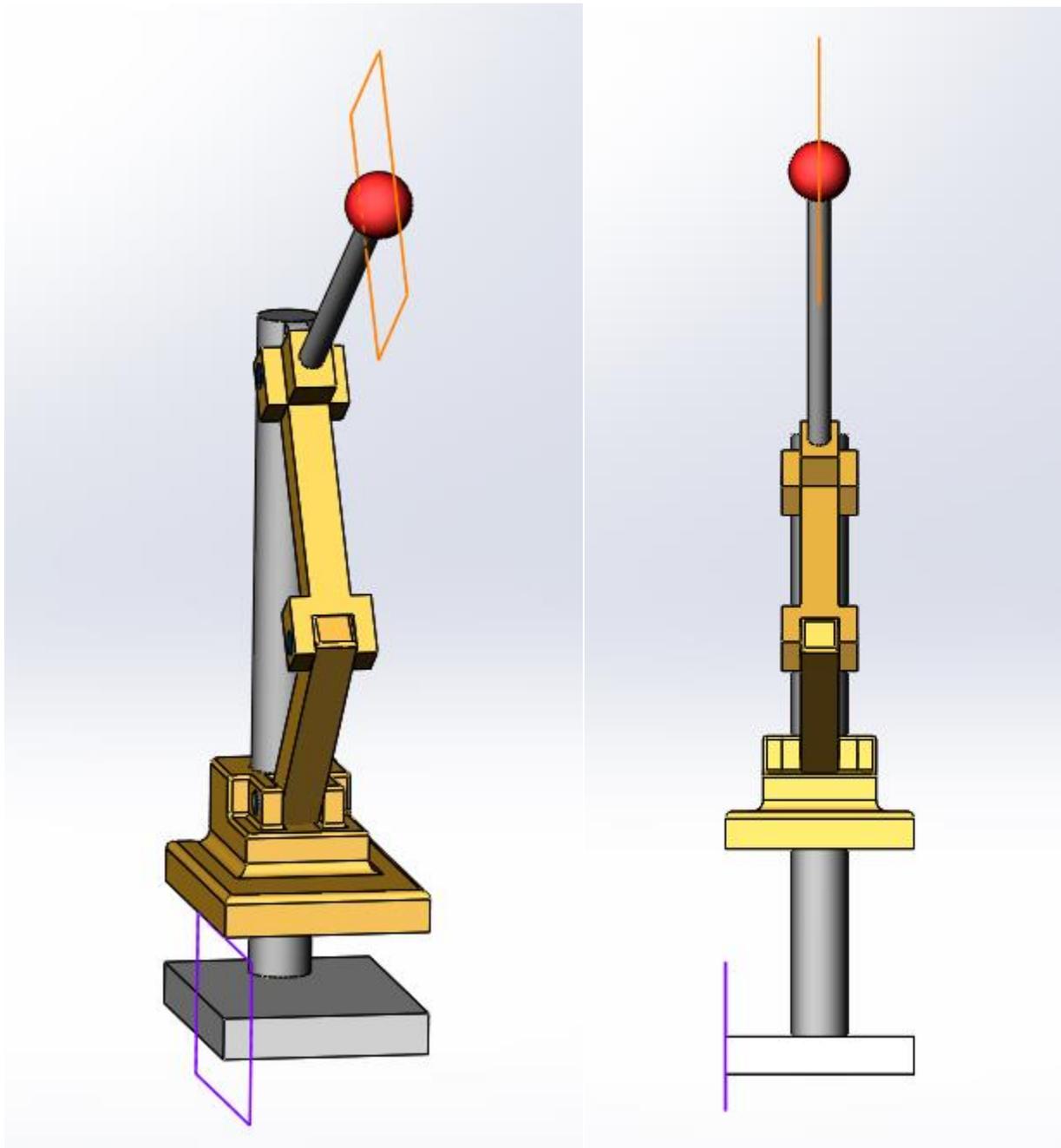
Directions: The base of the toggle press must be fixed to a reference (i.e. point/plane). This is to ensure that full assembly does not translate unnecessarily when the toggle handle is rotated. This will require a couple mates between the base piece and the coordinate planes and/or origin. Alternatively, the base part can be fixed in an arbitrary location. Mate all the other parts so that the final assembly functions as shown; where the output motion (upper base) is a response to the input motion (handle rotation).



Tip 1:

When assembling the 'handle' component to 'link2', you must restrict the rotation of the handle about its axis. If it is not restricted, the handle will simply spin about its axis rather than move with 'link2'.

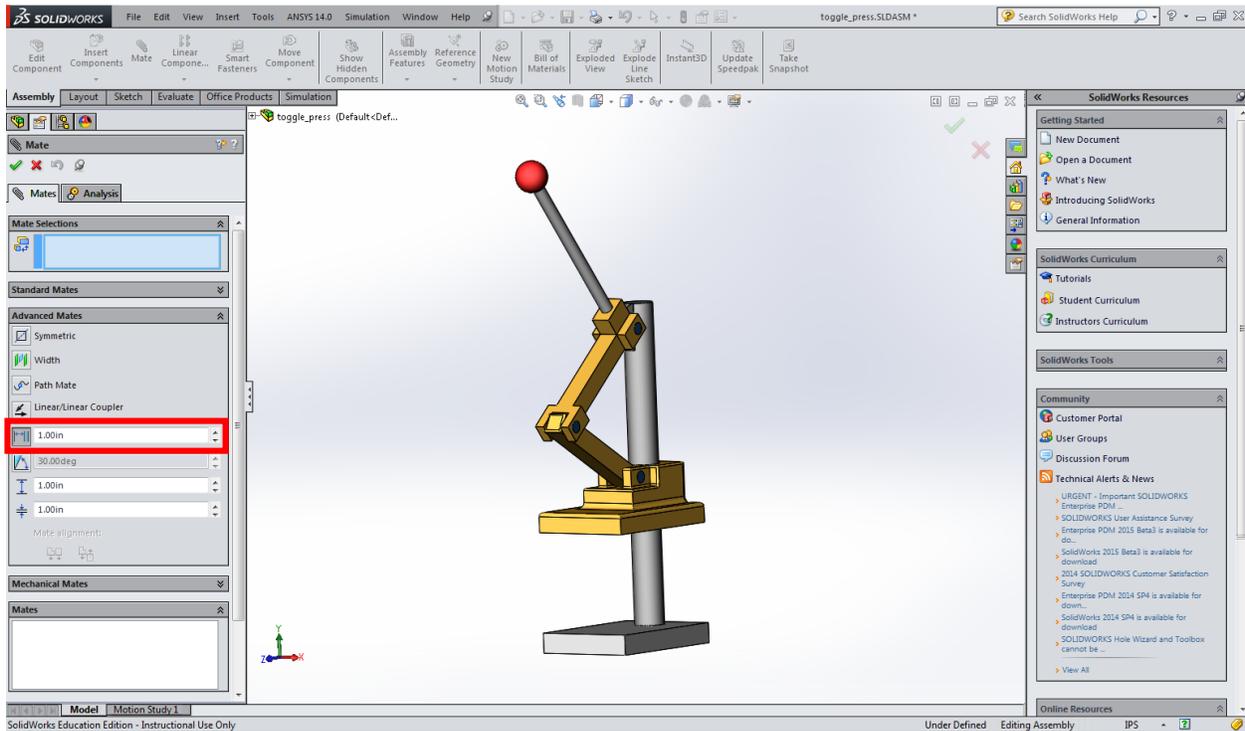
To provide an anti-rotational constraint, you can create a *parallel* mate between one of the default planes within the handle component and another *fixed* assembly plane (see the figure below, where the left face of the 'lowerbase' component is used as the parallel plane).



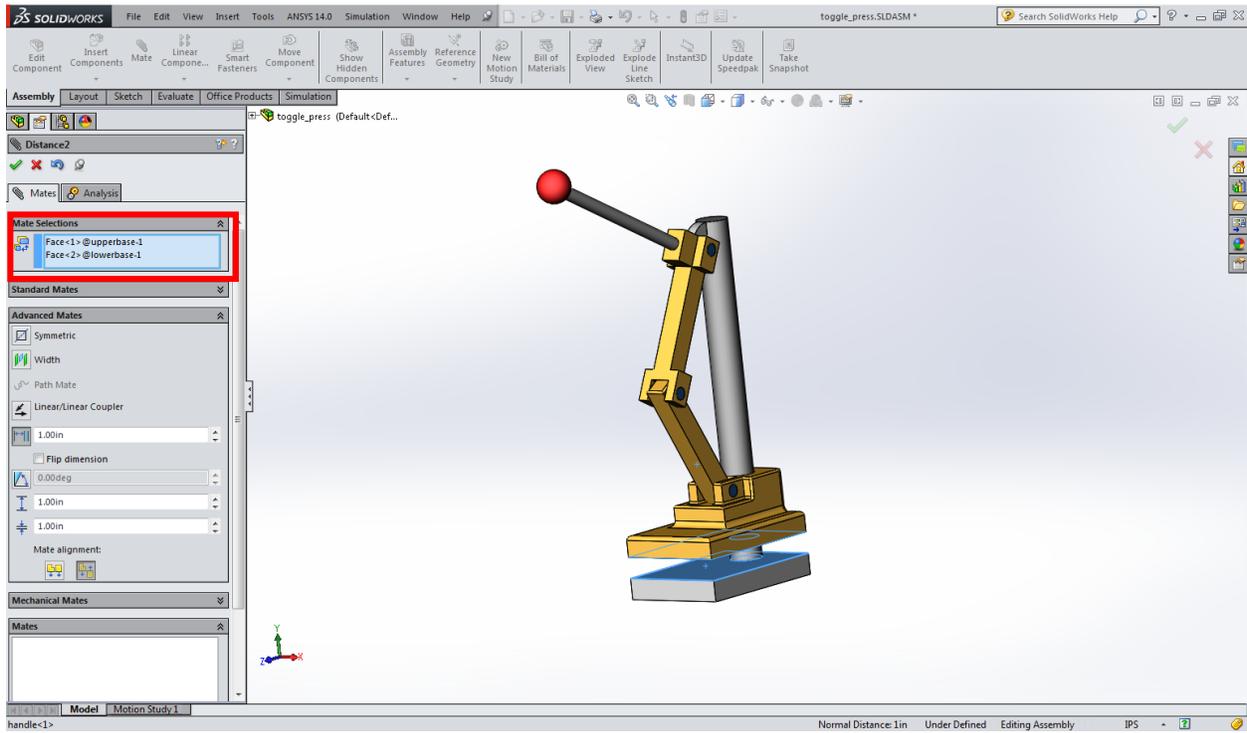
Tip 2:

Once the toggle press is completely assembled, *Advanced mates* can be used to limit the assembly's range of motion.

First, select *Mate*, then *Advanced Mates*. Select *Distance* as the type of mate.



Next, select the bottom face of the 'upperbase' component and the upper face of the 'lowerbase' component.



In the *Advanced* mates window, you can specify a *Maximum* and *Minimum* distance between the selected faces. Enter '6.00in' as the *Maximum* distance and '0.00in' as the *Minimum* distance, then test the constraints by dragging the 'handle' component.

These constraints will limit the range of motion of the 'upperbase' component relative to the 'lowerbase' component.

