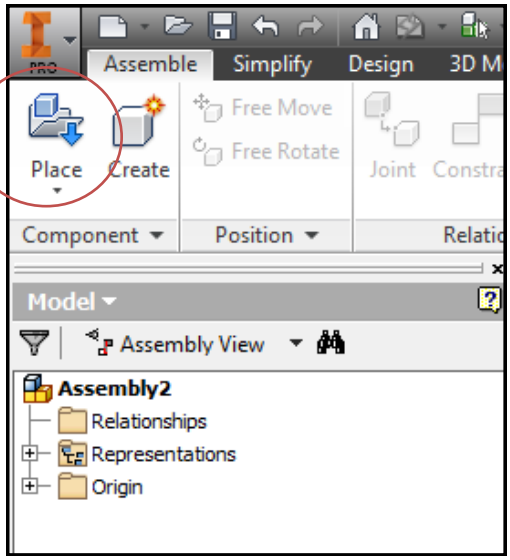
Assembly Exercise. Adaptive Spring

Create an adaptive spring with realistic compression movement.

Step # 1. From the New File dialog box , select the *Standard.iam* template.

FIG 1.0



Step # 2. On the Assemble tab select the *Place Command*.

In the place component dialog select Clevis.ipt and place two instances of the component in the assembly.

FIG 2.0

Step # 3. In the browser right click one of the Clevis and select *Grounded*.

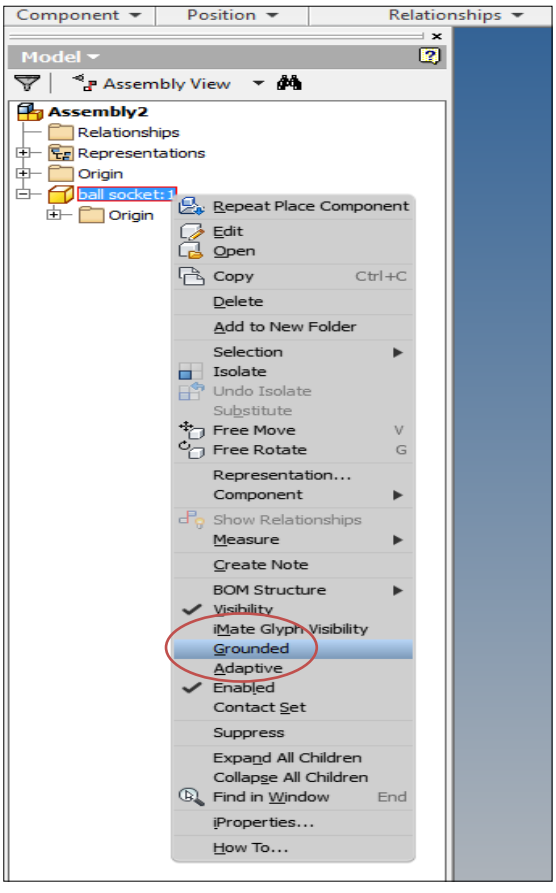
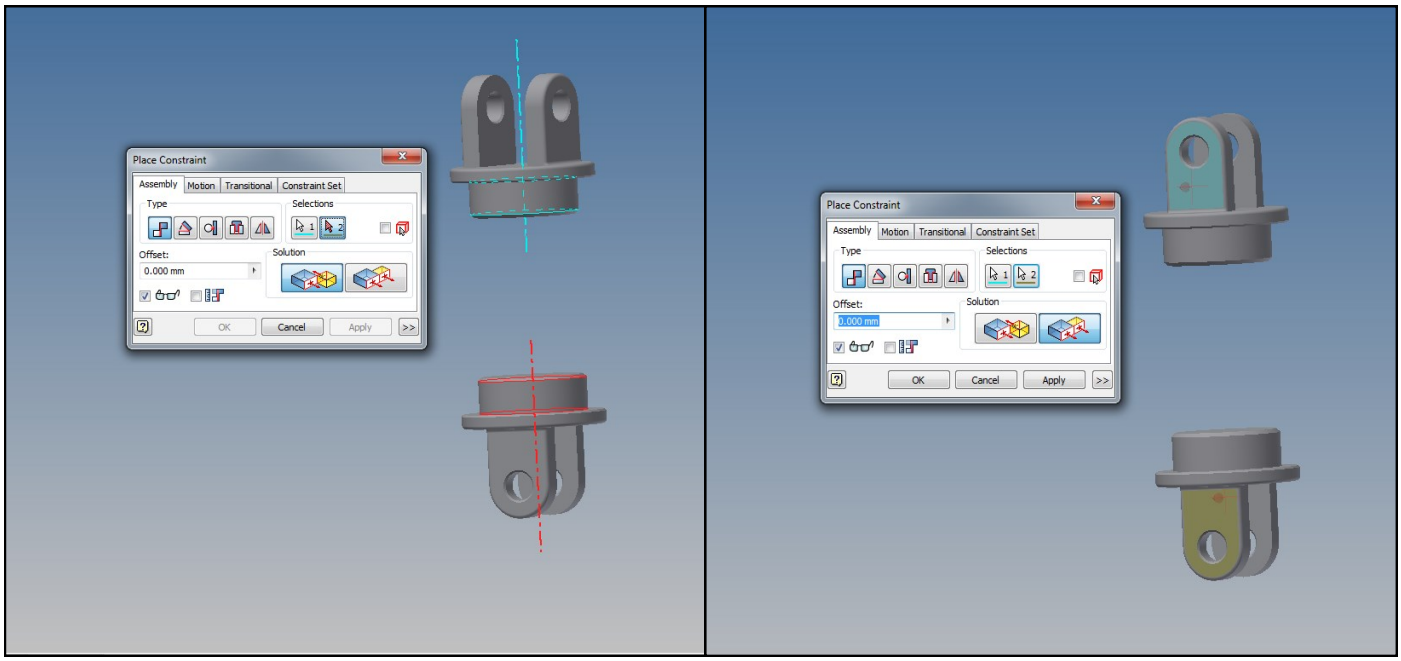


FIG 3.0

Step # 4. Apply mate constraints to the two Clevis as shown in Fig 4.0

Apply a second set of flush constraints so the are aligned vertically in space.



Step # 5. On the Manage Tab Panel select *Parameters.*

In the parameters dialog box click "Add Numeric".

Name the parameter SH and give it a value of 100 mm.

Click Done.

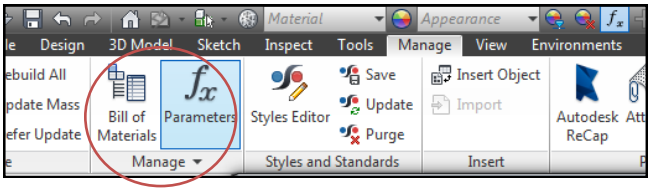


FIG 5.0

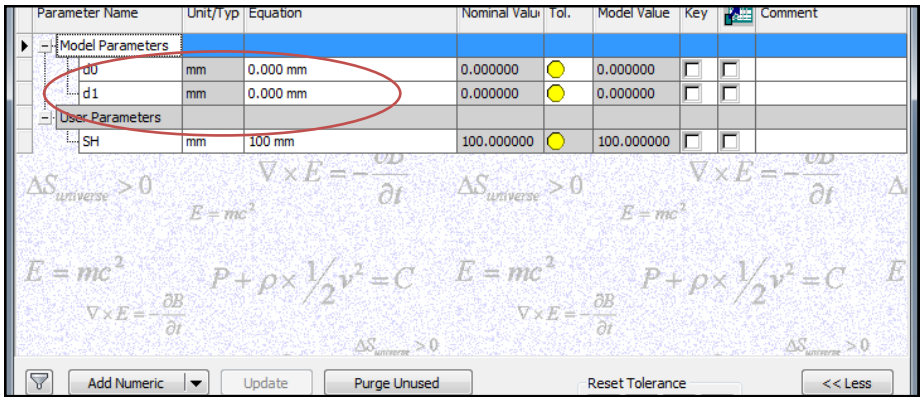


FIG 6.0

Step # 6. Apply one last Mate constraint between the two faces of the Clevis. As shown in Fig 7.0

In the Offset setting enter "SH" as shown in Fig 7.0a

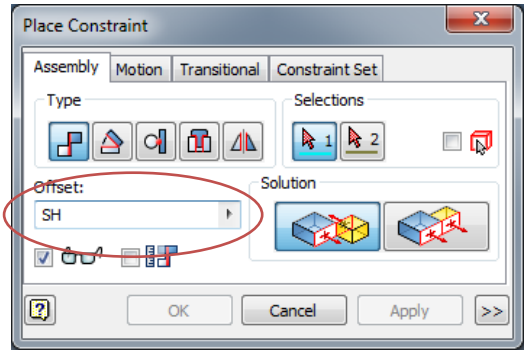


FIG 7.0 a

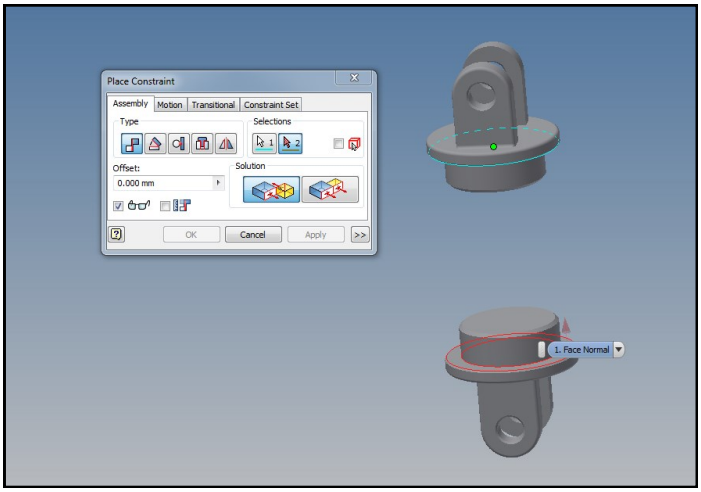
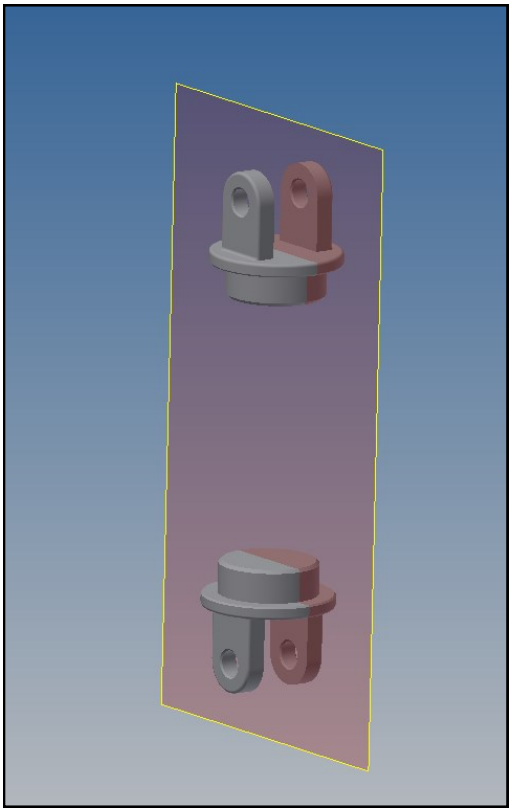


FIG 7.0



Step # 7. Place a workplane on the centreline of the two Clevis.

As shown in Fig 8.0

FIG 8.0

Step # 8. Use the *Create* Command , create a component, call it spring

As shown in Fig 9.0

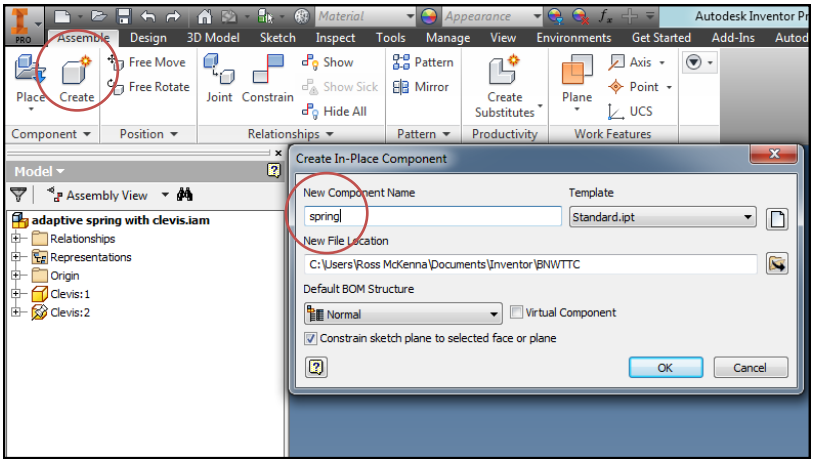


FIG 9.0

Step # 9. Create the Spring.

Start a new sketch on the workplane you just created. Project the edge geometry to assist in the spring sketch. Sketch the spring geometry as shown in Fig 10. Be sure to dimension the length of the centreline and accept that it is a ***driven dimension***. Finish the sketch.

Using the Coil command, select circle as “profile” and the centreline as “Axis”. The axis direction may have to be flipped the get the correct direction.

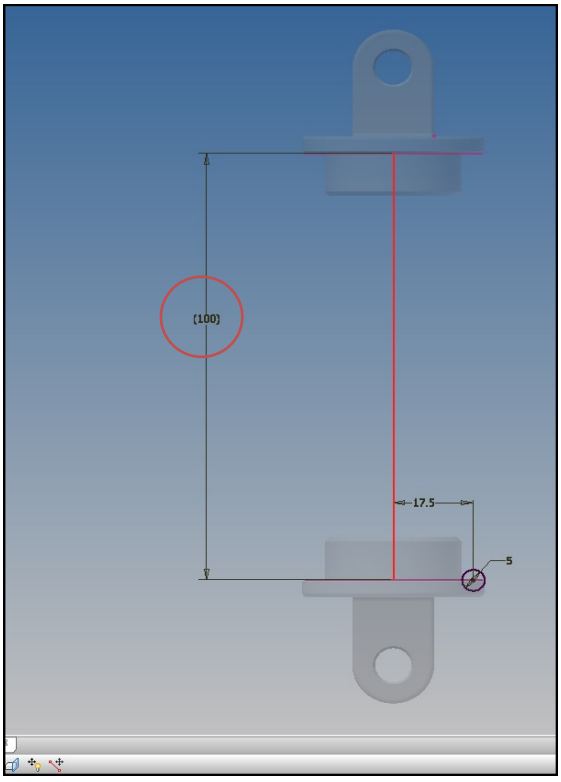


FIG 10.0

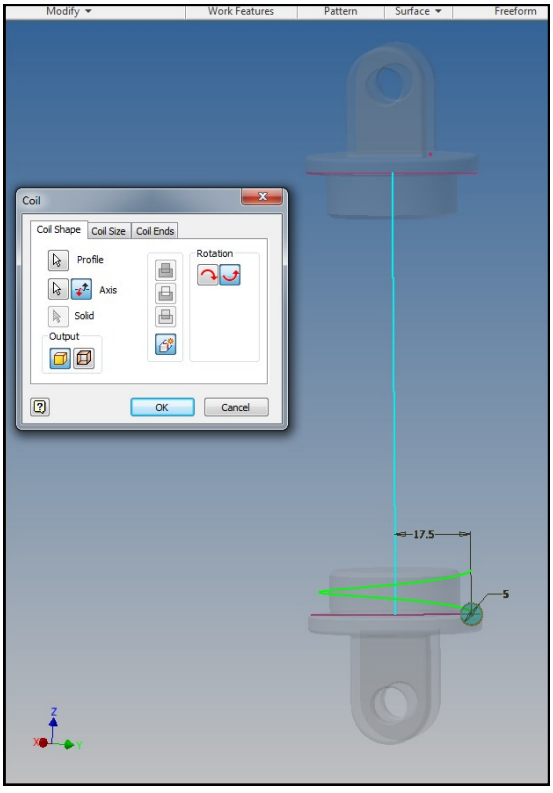


FIG 11.0

Step # 10. In the Coil Size Tab, select "*Revolution and Height"* as the type, "10" as the number of *Revolutions* , and in the *Height* text box click on the driven dimension (*100)* As shown in Fig 12.0

Ok the dialog box, a view similar to Fig 12a should be the result. Return to the top level assembly.

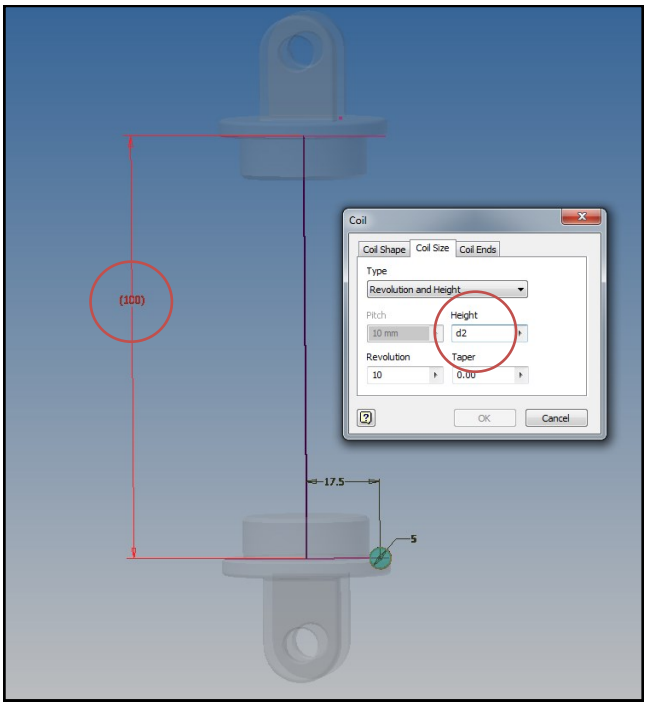


FIG 12.0

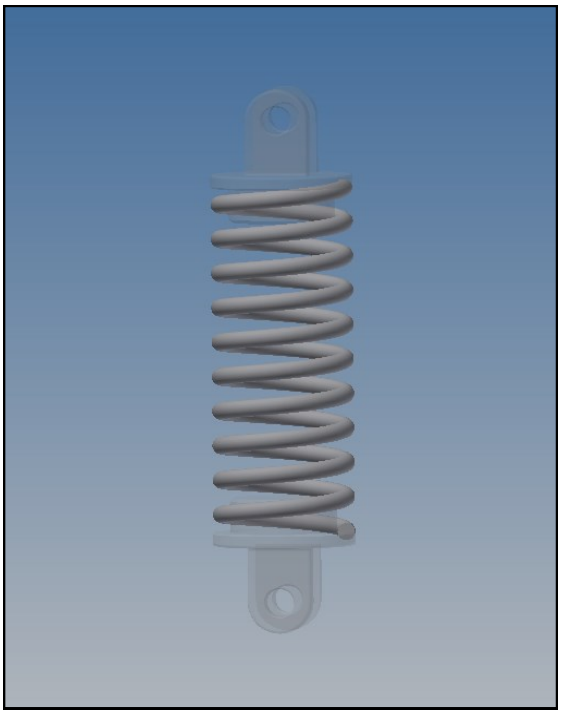


FIG 12.0a

Step # 11. Expand the browser on the Clevis 1 instance, and on the Mate Constraint right click and select Drive.

Expand the dialog box and make sure "*Drive Adaptivity*" is checked. Select a value of "60" in the "End" text box and click the "Play" button. The spring and the non-grounded clevis should animate. Experiment with different values for realistic movement.