

Assembly Exercise. Gear Animation

Animate 2 spur gears and create a realistic movement.

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



FIG 1.0

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

In the place component dialog select *Gear yoke.ipt* and place one instance of the component in the assembly.

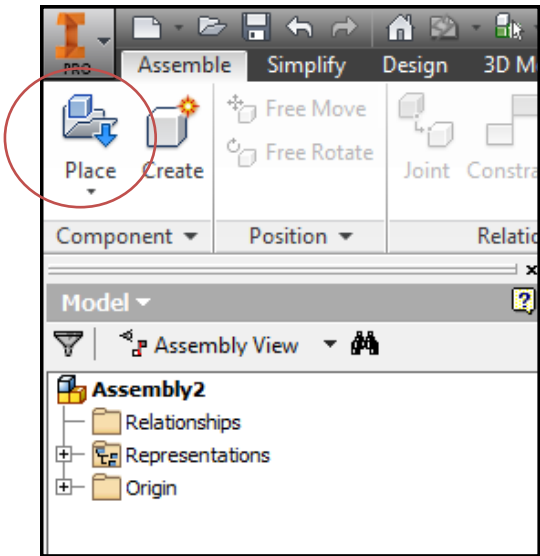
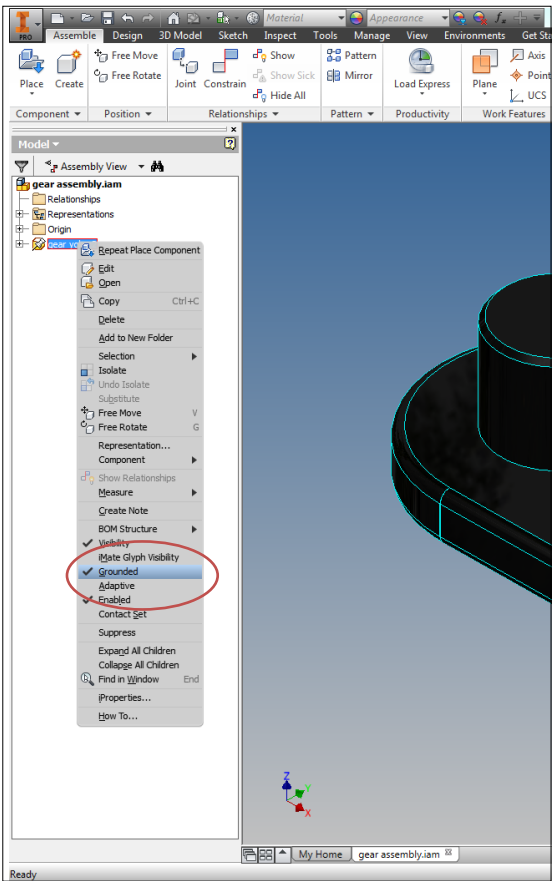


FIG 2.0

Step # 3. in the browser right click gear yoke and select *Grounded*.

FIG 3.0



Step # 4. On the *Design Tab* select *Spur Gear* as shown in Fig 4.0

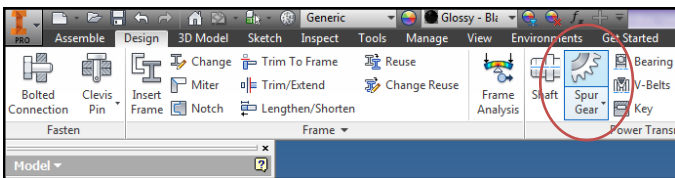


FIG 4.0

Step # 5. On the *Spur Gears Component Generator*,

Select values as shown in Fig 5.0

In the exercise the two gears will be created separately to aid the animation process.

Take note of the *Desired Gear Ratio* (1.2667)

and the *Center Distance* (76.5mm)

Click OK to create the 45 tooth gear.

Repeat the process to create the 57 tooth gear as shown in Fig 6.0

FIG 5.0

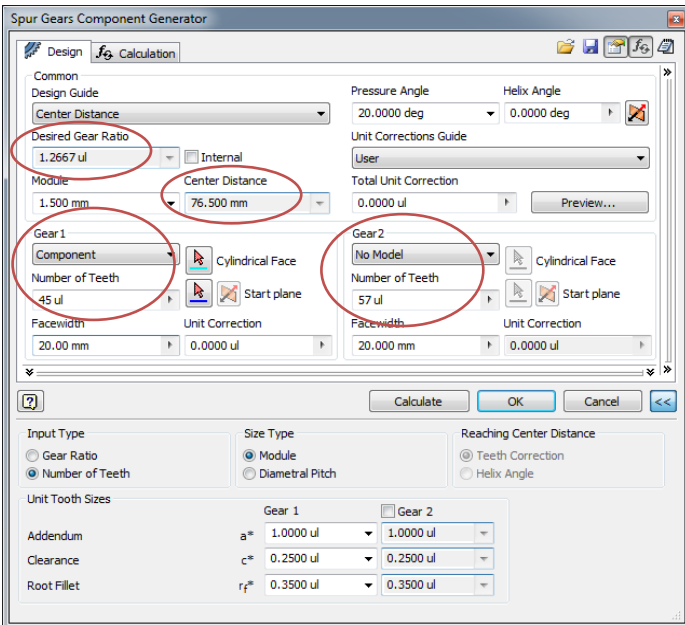
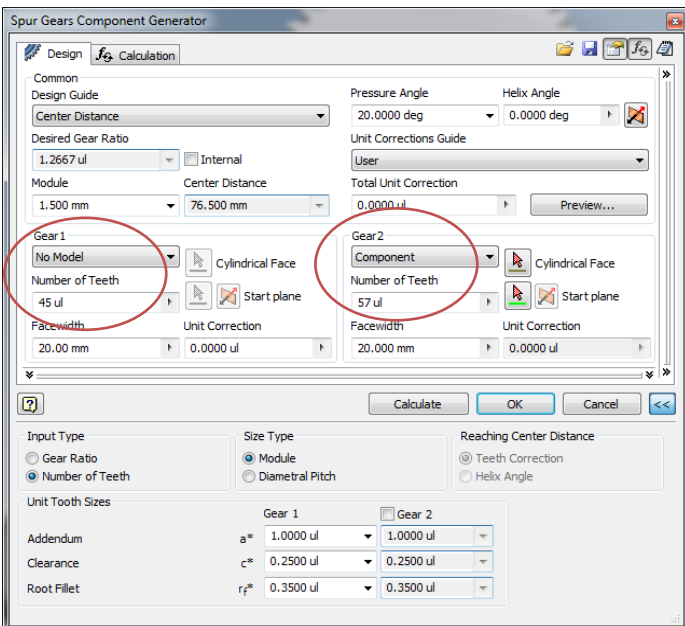


FIG 6.0



Step # 6. Results of gear creation as shown in Fig 7.0 over page

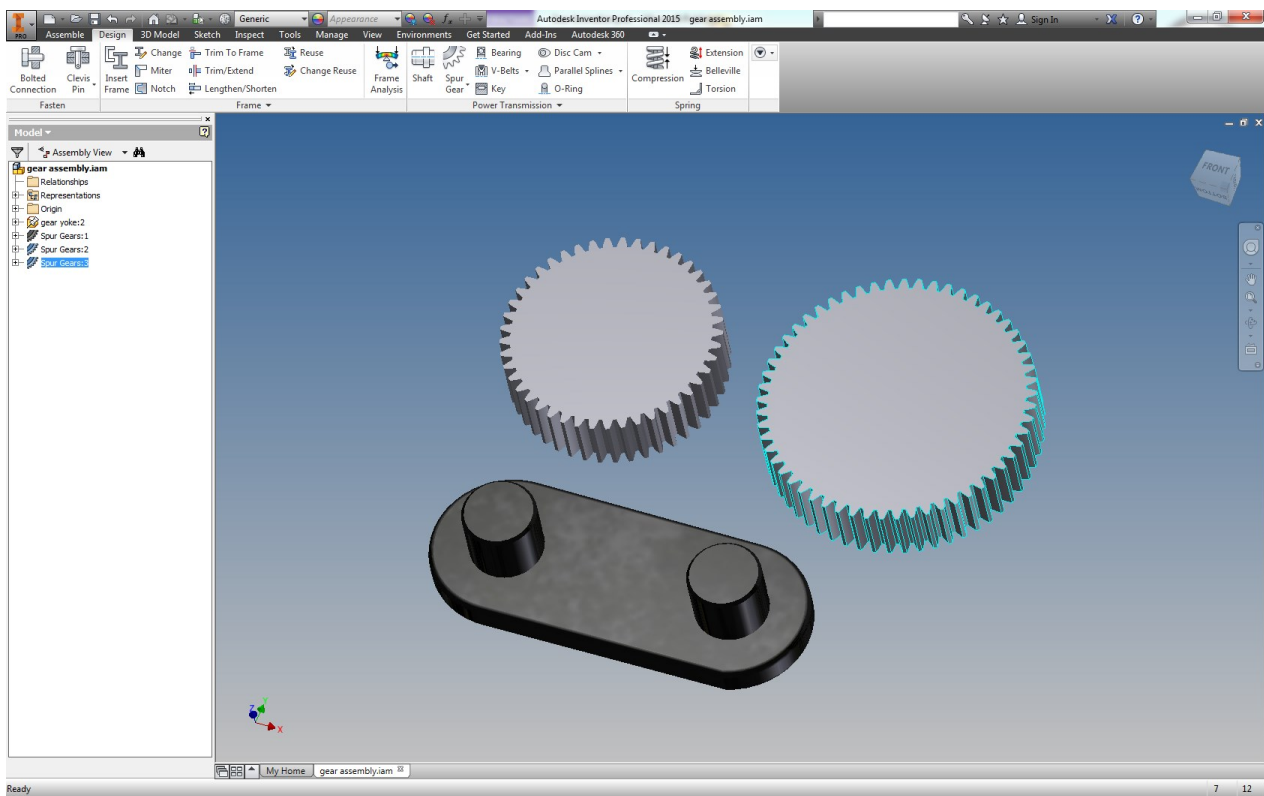
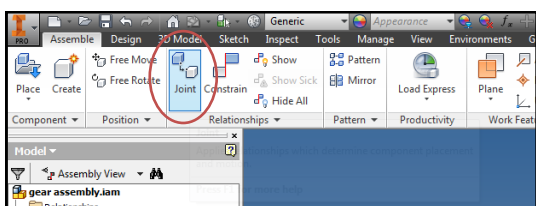


FIG 7.0



Step # 7. Using the *Joint* Command place the two gears on the gear shafts as shown in Fig 9.0 and 9.0a

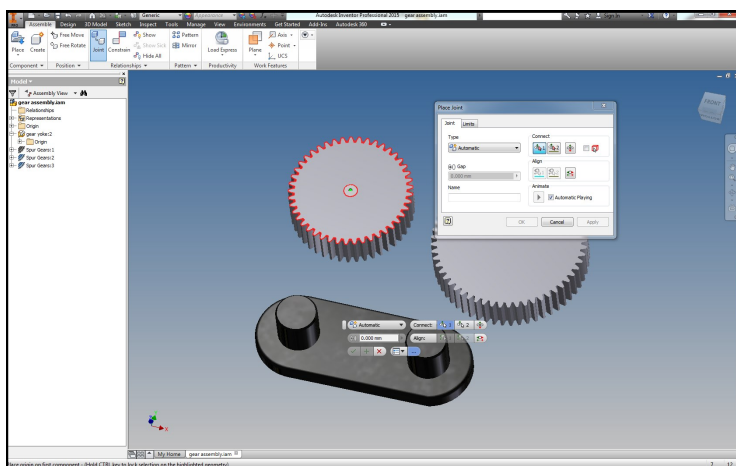


FIG 9.0

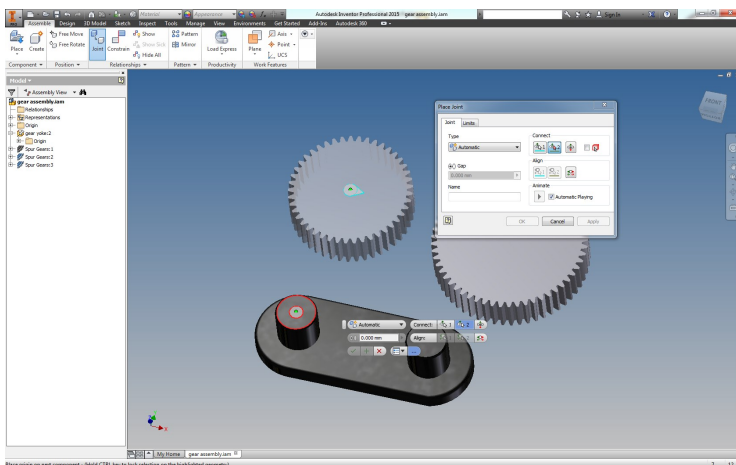


FIG 9.0a

An assembled view of the gears can be see in Fig 10.0.

The center distance of the two shafts is 76.5 mm as calculated in the gear generator.

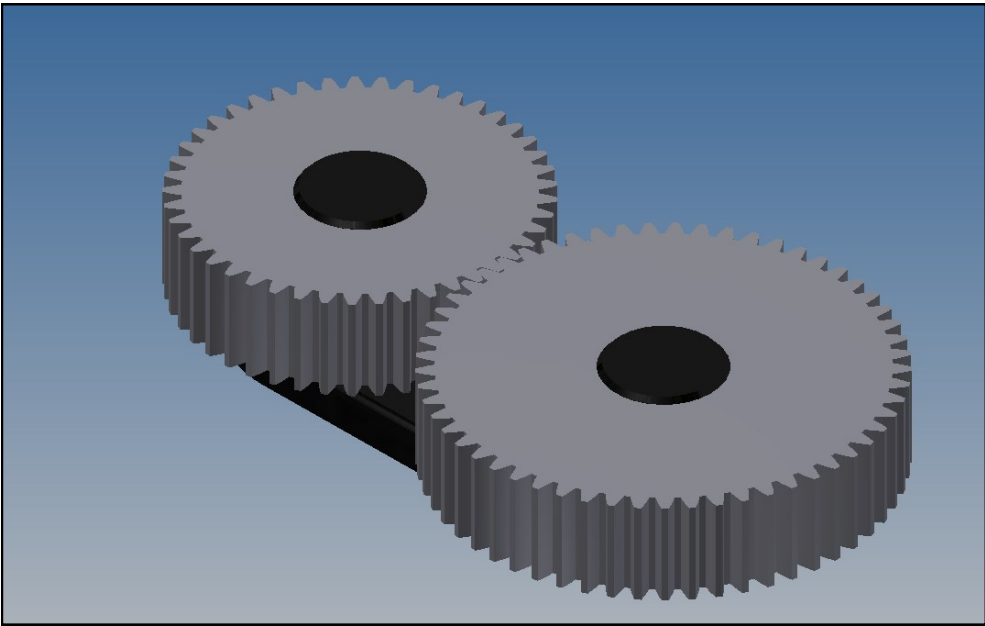
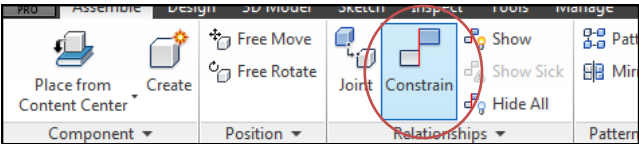


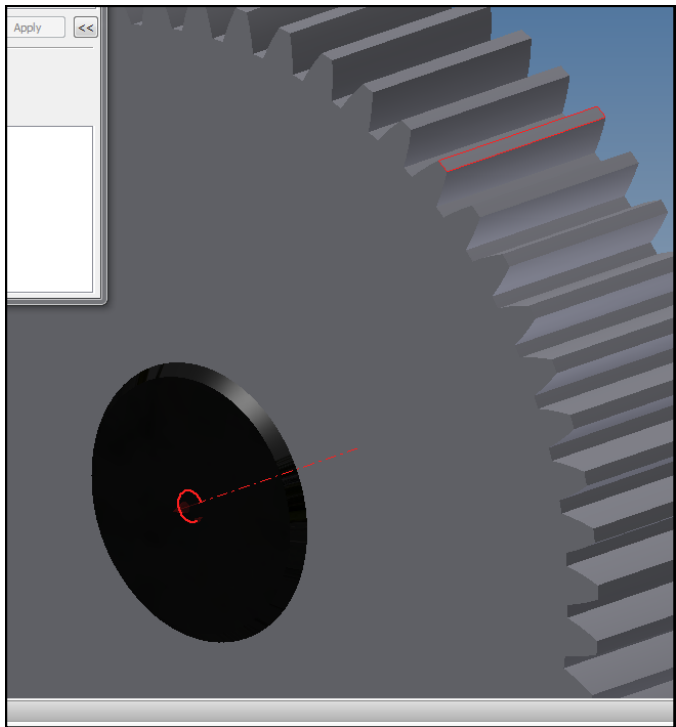
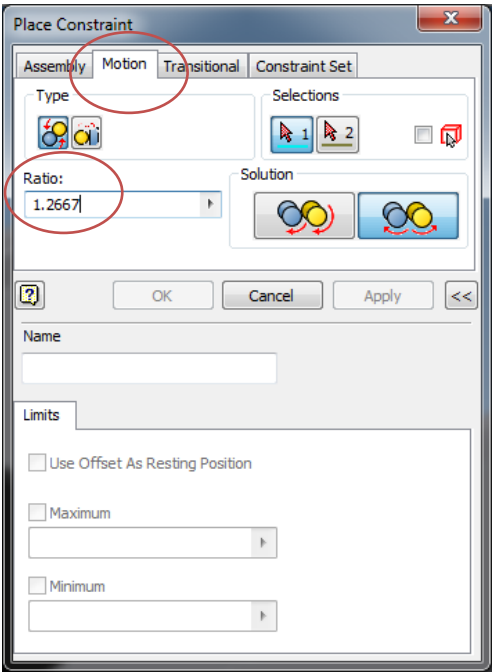
FIG 10.0

Step # 8. Constraining the gears to create a animation.



On the *Place Constraint* Dialog box select the *Motion* Tab.

In the Ratio text box put the gear ratio (1.2667) calculated by the gear generator. Select the rotational axis of each gear as shown in Fig 11.0



The gears should now rotate realistically.

FIG 11.0

Step # 9. Adding an angle constraint to drive the gears.

In the browser expand the Assembly origin instance and the origin instance of one of the gears as in Fig 12.0

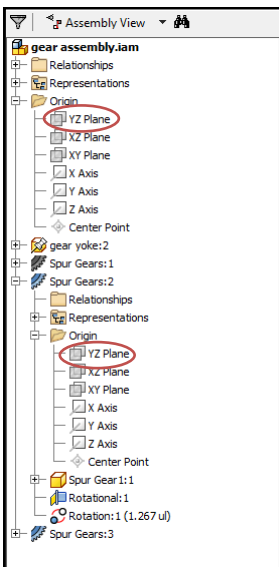
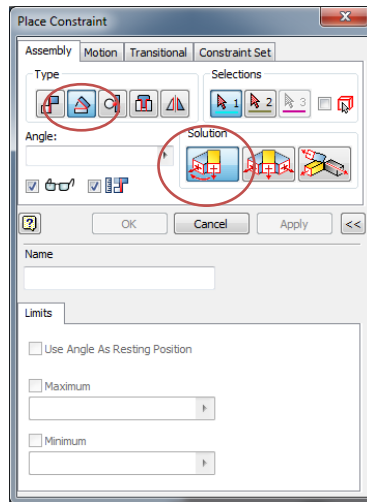


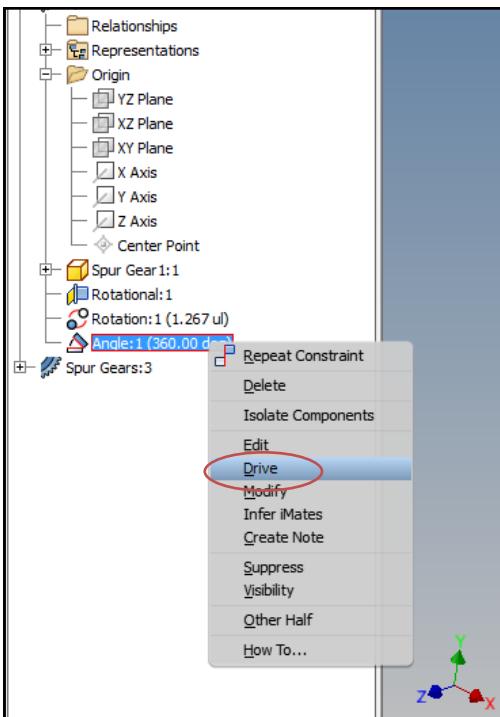
FIG 12.0



In the *Place Constraint* dialog box select an *angle* constraint and a *directed angle* solution.

Select the YZ planes in the Browser. (Fig 12.0)

OK the dialog box.



In the browser right click on the new angle constraint and select drive.

Set values as in the Drive dialog box below and press the *Forward* button.

