Spur Gears Connections

Topics in this section

Design Spur Gears Connections
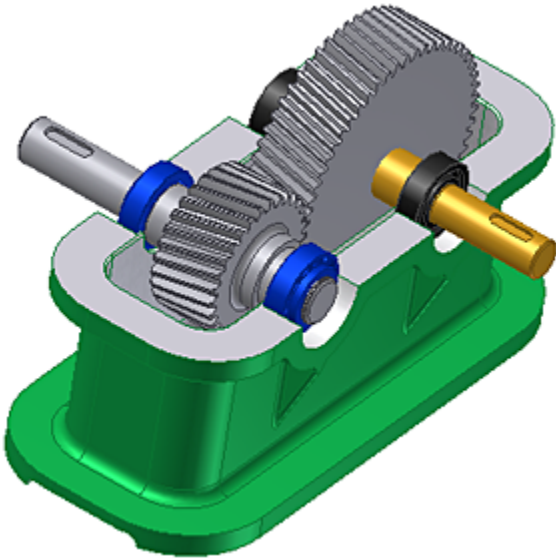
Category	**Mechanical Design**
Emphasis	15 - 20 minutes
Tutorial File Used	SpurGear.iam (metric)

Design a spur gears connection using the Design Accelerator Spur Gears Generator. Develop your design in a standards-based, automated fashion that saves extensive assembly and part modeling.

Objectives

- Specify placement of gears.
- Set the method of design.

- Set file names.

- Insert the spur gears connection into the assembly.

Prerequisites

- Know how to set the active project and navigate the model space with the various view tools.

- See the Help topic "Getting Started" for further information.

Navigation Tips

- Use **Show** in the upper-left corner to display the table of contents for this tutorial with navigation links to each page.

- Use **Forward** in the upper-right corner to advance to the next page.

Open Sample File and Start Generator

1. Set your active project to **tutorial_files**.

2. Open **Spur Gears** ➤ **SpurGear.iam**.
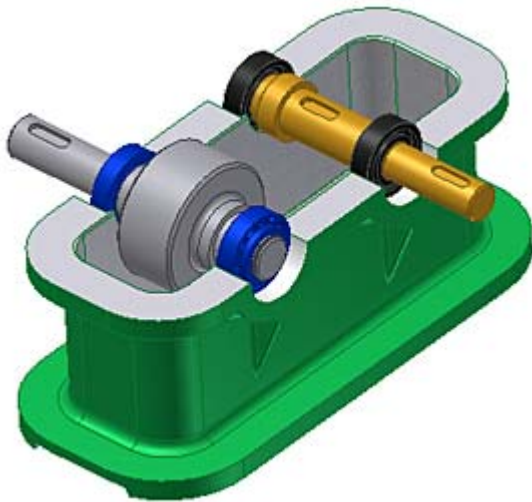
3. On the ribbon, click Design tab ➤ Power Transmission panel ➤ Spur Gear.

   Design Accelerator generators open in the last valid state a component was inserted into the Autodesk Inventor assembly.
   Note Hold the **Ctrl** key while clicking the **Spur Gear** command to load the Spur Gears Generator with the default installation data.

Spur Gears Dialog Box

When you start the Spur Gears Component Generator, it opens on the Design tab. You can enter specific parameters, define spur gears placement, and select methods of calculation.

The Design tab is divided into several group boxes with options:

Common

This area includes parameters common for both gears, such as module or helix angle.

The Design Guide drop-down menu contains five possible options of design and calculation. Based on your selection of the design guide, the edit fields within the Design tab are enabled. Every method requires different input parameters.
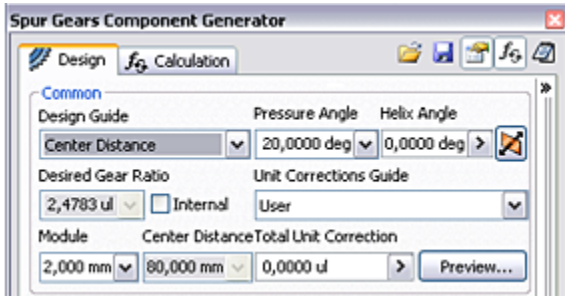
Gear 1, Gear 2

This area includes parameters that can vary for Gear 1 and Gear 2 such as number of teeth or face width. Also, commands for placement specification of Gear 1 and Gear 2 are located here.

Use the drop-down menu to select the type of gear to insert: component, feature, or no model.
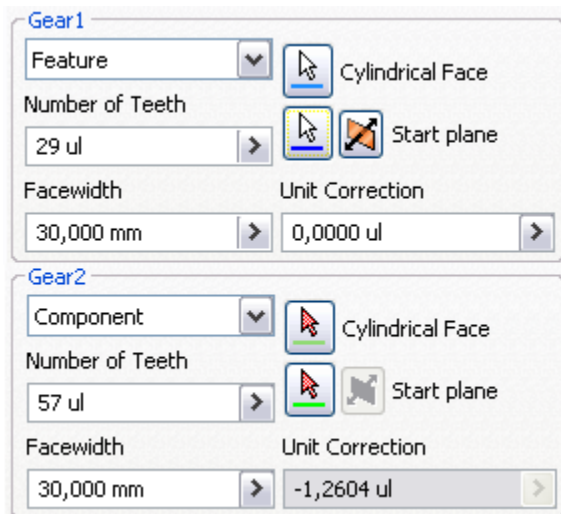
More Options

When you click the [>>] **More options** command, located in the lower-right corner of the Design tab, the area with other options for spur gears design opens. For example, if you select **Number of Teeth** in the **Input Type** group box, it indicates that number of teeth is a known value.

Results

Double-click the double line on the right, or click the chevron to display the Results pane with the list of calculated values. The values in gray indicate that results do not match the inserted values in the Design tab. Click **Calculate** to get results for current inputs.

Select Gear Options

1. Within the Common area of the Design tab, select the **Module** option from the **Design Guide** drop-down menu. The selected option indicates what the design and calculation is based on. In this tutorial, we select the Module option.
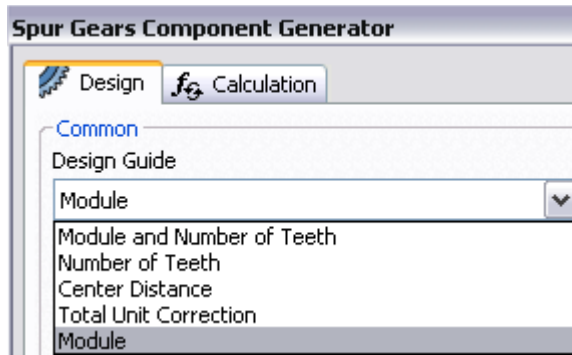
2. Click the **>>** **More Options** command located in the lower-right corner of the Design tab for additional options for spur gears.

3. On the **Size Type** group box, select **Module**.

   If you design spur gears in a metric assembly, the generator selects the **Module** option by default. If you design spur gears using English units, the generator selects the **Diametral Pitch** option.

4. In the **Input Type** area, select the **Number of Teeth** option. In this case, the number of teeth is an input parameter.

5. In this tutorial, you insert one feature and one component. Select **Feature** from the drop-down menu in the **Gear 1** group box. The first gear is inserted as a feature of the shaft in the assembly.
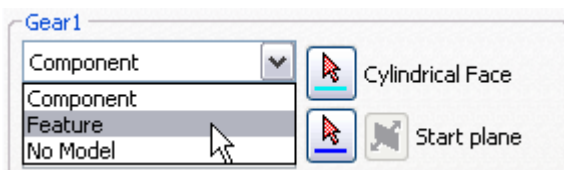
6. Select **Component** from the drop-down menu in the **Gear 2** group box. The second gear is inserted as a new part.
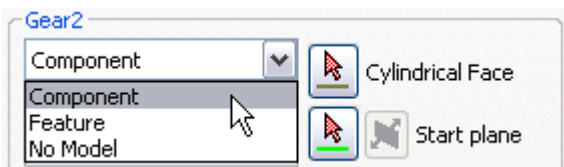

   Note Alternatively, you can select the **No Model** option to insert a calculation without a component or feature.

   Note If you insert features, you cannot use **Motion** for your gears to rotate them. It is possible only if you insert two components.
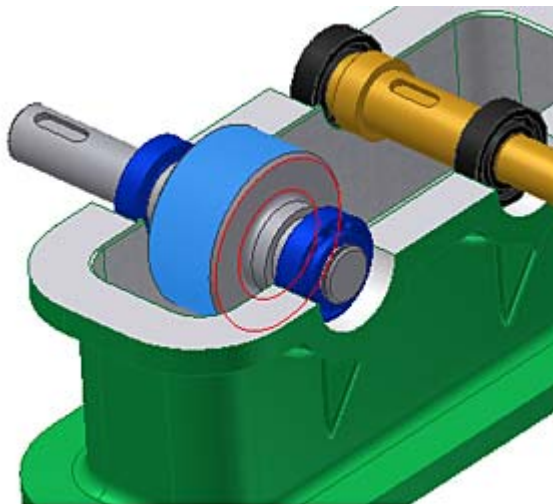
Place the Gear

1. To specify the placement for Gear 1, click **Cylindrical Face** in the **Gear 1** group box.

2. In the graphics window, select the cylindrical face as shown in the following image.
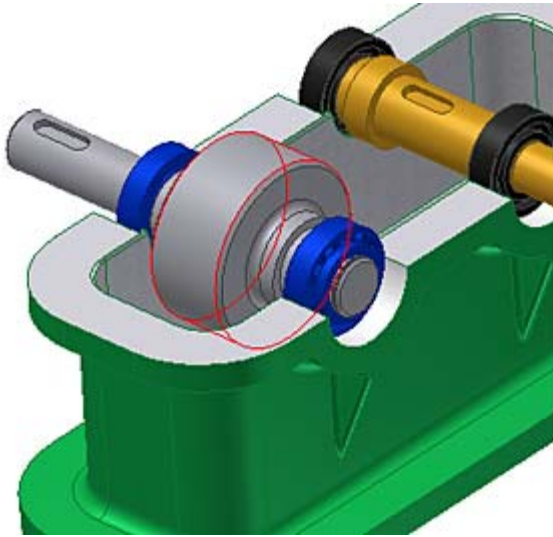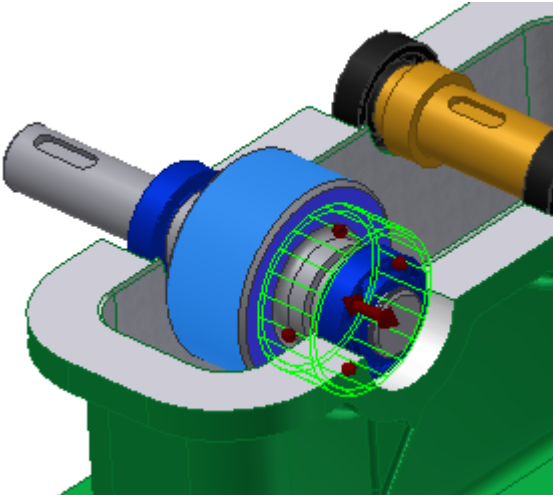
> **Note** The diameter of section on the shaft must be equal or greater than outside diameter of the gear.

3. Click the **Start plane** command to specify the start plane within the assembly.

4. In the graphics window, select the start plane as shown in the following image.

A preview shows Gear 1 in the specified position.

Place the Second Gear

Now, you can specify the position for the second gear.

1. In the **Gear 2** group box, click **Cylindrical Face**.

2. In the graphics window, select the cylindrical face to place the second gear as shown in the following image.

3. Click the **Start plane** command to specify the start plane within the assembly.

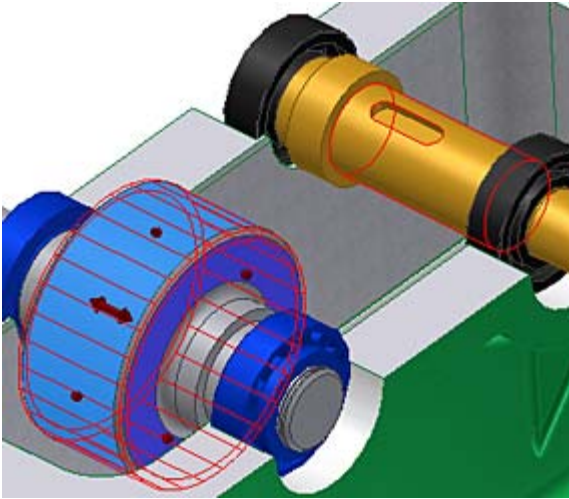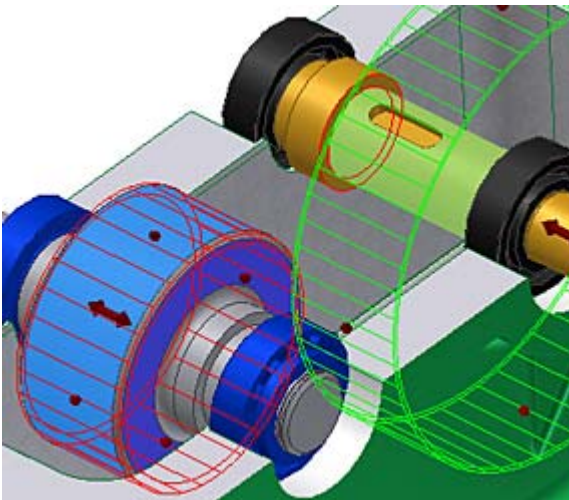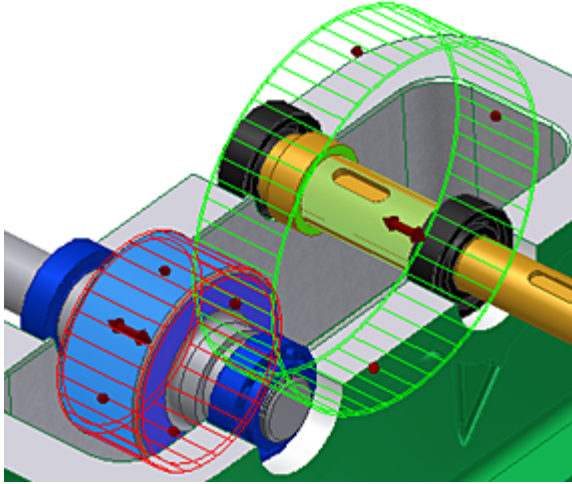4. In the graphics window, select the start plane as shown in the following image.

A preview shows Gear 2 in the specified position.

Enter Parameters

Now, you can enter parameters into the Common, Gear 1, and Gear 2 group boxes.

1. Set **Pressure Angle** value to 20 degrees.

2. Set **Helix Angle** value to 12 degrees.

3. Enter the correct number of teeth. Your gear design is based on these known parameters. Enter 29 into the **Number of Teeth** edit field in the Gear 1 area.

4. Enter 57 into the **Number of Teeth** edit field in the Gear 2 area.

5. Set both **Facewidth** values in Gear 1 and Gear 2 to 30 mm.

6. Set **Unit Correction** in Gear 1 area box to 0.

Perform the Calculation and Set File Names

1. To perform the calculation, click **Calculate**. The preview updates, and the message in the **Summary of messages** area reports that the calculation completed successfully.

2. To open the **Summary of messages** area located at the bottom of the **Calculation** and **Design** tabs, double-click the **double line** at the bottom of the tabs, or click the chevron at the bottom of the tabs.

   In the graphics window, the preview of the spur gears connection reflects all inserted values, such as numbers of teeth.

3. Click **OK**. The File Naming dialog box opens.
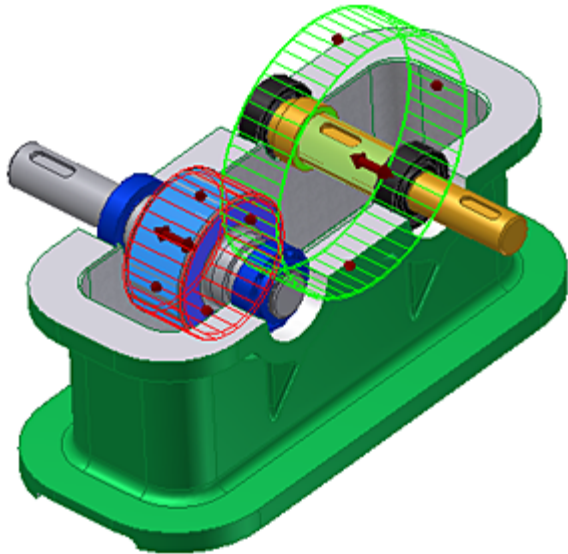
In the File Naming dialog box, you can specify the Display name and File name for Design Accelerator components and features. When the **Always prompt for filename** box is checked, the dialog box opens every time you insert the Design Accelerator component or feature.

4. Click **OK** to insert the spur gears connection into the assembly.
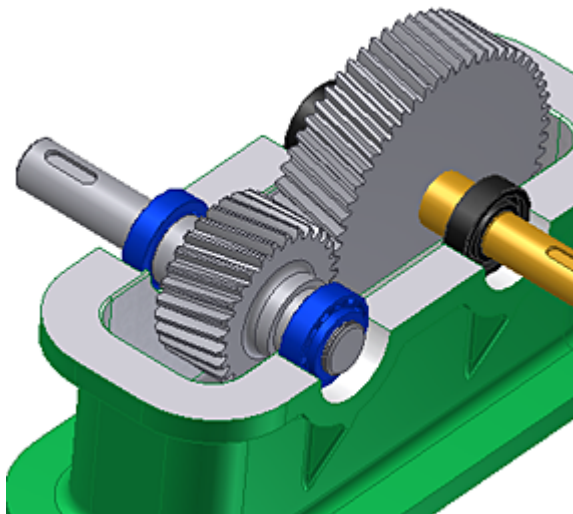
Summary
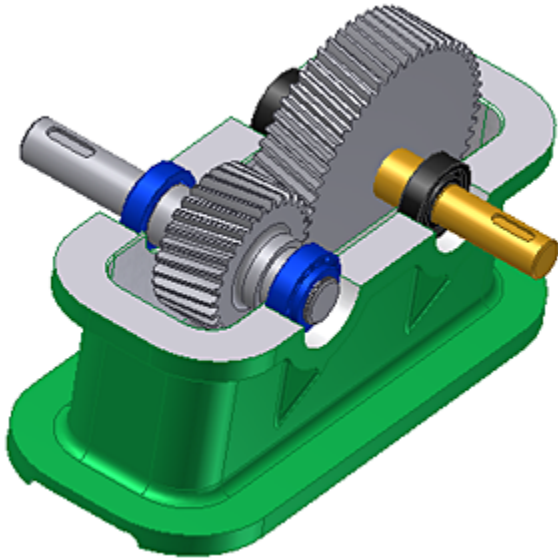
Using the Spur Gears Generator, you learned how to:

- Start a Spur Gears connection.

- Set calculation options.

- Place components.

- Perform the calculation.

- Set file names.

Check the Help for further information about generators.