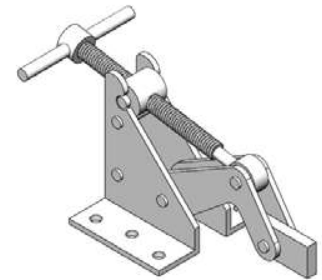


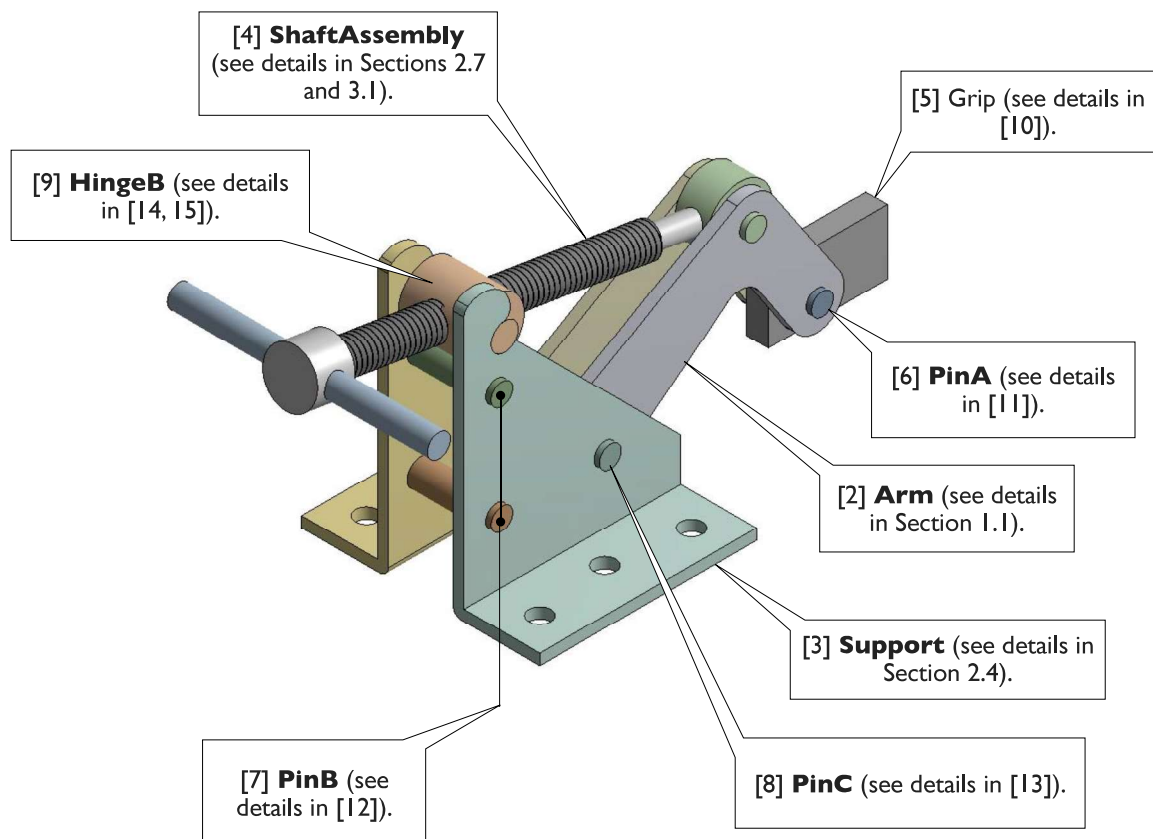
# Section 3.3

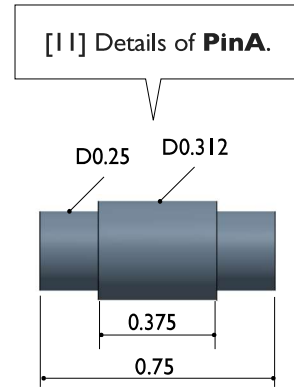
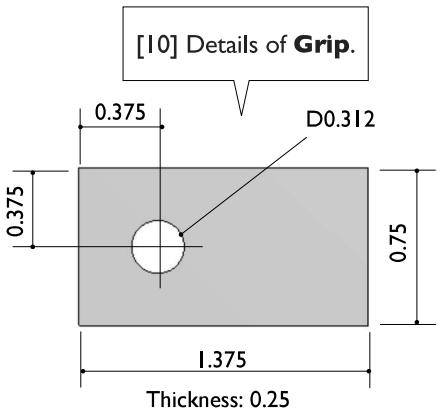
## Clamp



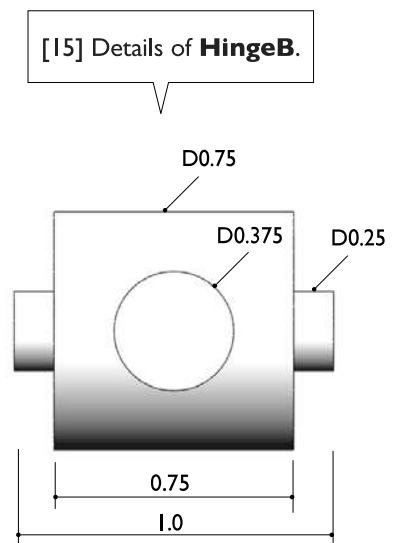
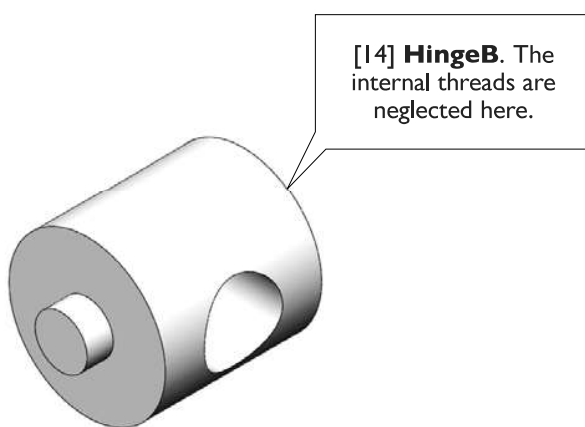
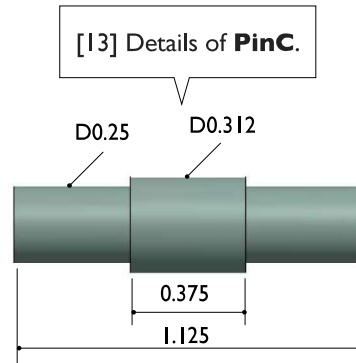
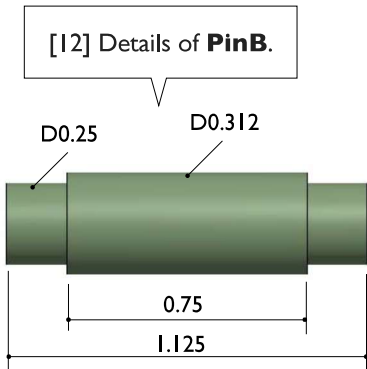
### 3.3-1 Introduction

[1] In this section, we'll create a **clamping mechanism** mentioned in Sections 1.1, 2.4, 2.7, and 3.1. The assembly consists of 8 kinds of components [2-9], of which the **Arm** [2] was created in Section 1.1, the **Support** [3] was created in Section 2.4, and the **ShaftAssembly** [4] was created in Sections 2.7 and 3.1. Details of other components are shown in [10-15].





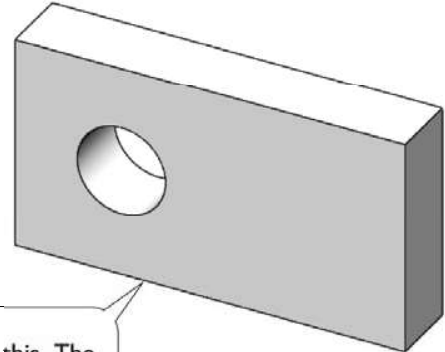
Unit: in.



### 3.3-2 Create **Grip**



[1] Launch **SolidWorks**. Click **New** to create a new part. Set up **IPS** unit system with 3 decimal places for the length unit.

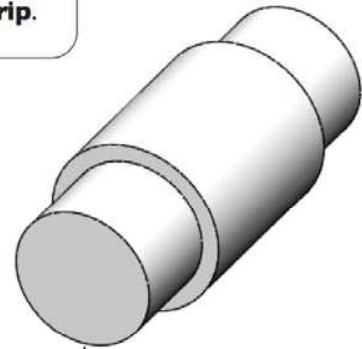


[2] Create a 3D model like this. The details are shown in 3.3-1[10]. Use any coordinate system as you like. Save the part with the file name **Grip**.

### 3.3-3 Create **PinA**



[1] Click **New** to create a new part. Set up **IPS** unit system with 3 decimal places for the length unit.

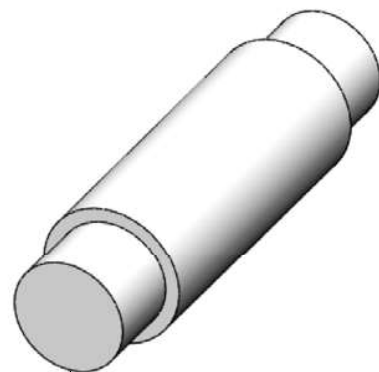


[2] Create a 3D model like this. The details are shown in 3.3-1[11]. Use any coordinate system as you like. Save the part with the file name **PinA**.

### 3.3-4 Create **PinB**



[1] Click **New** to create a new part. Set up **IPS** unit system with 3 decimal places for the length unit.

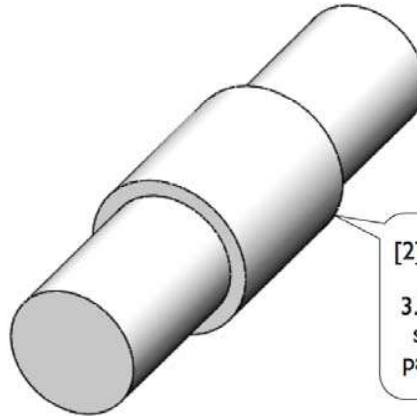


[2] Create a 3D model like this. The details are shown in 3.3-1[12]. Use any coordinate system as you like. Save the part with the file name **PinB**.

### 3.3-5 Create **PinC**



[1] Click **New** to create a new part. Set up **IPS** unit system with 3 decimal places for the length unit.

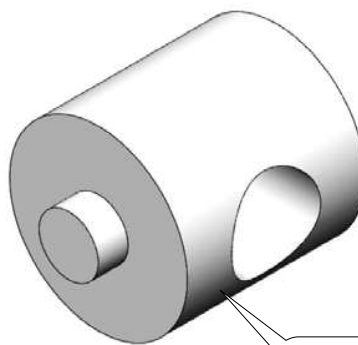


[2] Create a 3D model like this. The details are shown in 3.3-1 [13]. Use any coordinate system as you like. Save the part with the file name **PinC**.

### 3.3-6 Create **HingeB**



[1] Click **New** to create a new part. Set up **IPS** unit system with 3 decimal places for the length unit.



[2] Create a 3D model like this. The details are shown in 3.3-1 [14, 15]. Use any coordinate system as you like. Save the part with the file name **HingeB**.

### 3.3-7 Create a New Assembly and Insert a **Support**

[1] Click **New**.

[2] Select **Assembly**.

[3] Click **OK**.

[4] In the **Head-Up Toolbar**, turn on **View Origins**.

[5] The assembly's origin.

[6] Click **Browse** and open the part **Support**, which was saved in Section 2.4.

[7] Click the origin. Now the **Support** is inserted and fixed in the space. It's okay if your origin is different from here.

Begin Assembly

Message

Select a component to insert, then place it in the graphics area or hit OK to locate it at the origin.

Or design top-down using a Layout with blocks. Parts may then be created from the blocks.

Create Layout

Part/Assembly to Insert

Open documents:

- Grip
- HingeB
- PinA
- PinB
- PinC

Browse...

\*Trimetric

### 3.3-8 Mirror the **Support**

[1] In **Assembly Toolbar**, pull-down **Linear Component Pattern** and select **Mirror Components**.

[2] For **Mirror plane**, select the **Front** plane of the assembly (see [3])

[3] **Front** plane of the assembly.

[4] For **Components to Mirror**, select **Support** from **Features Tree** (see [5]).

[5] The **Support**.

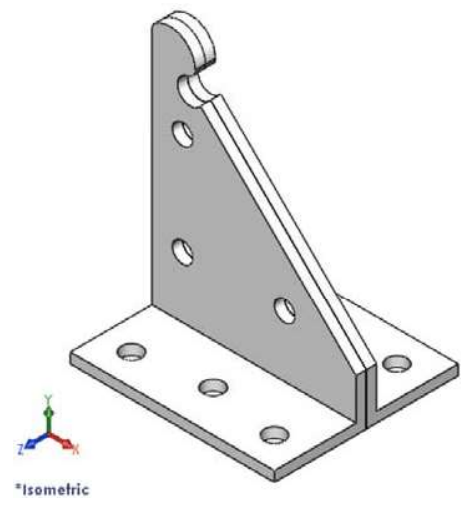
[6] Click **Next**.

[7] Click **Create opposite hand version**.

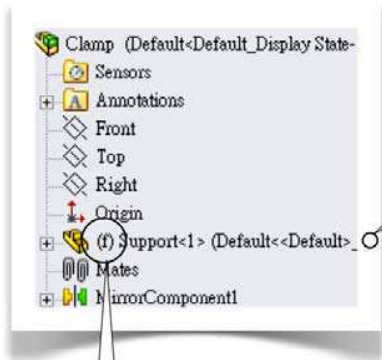
[8] Click **Next**.

[9] It says that the geometry of the mirrored **Support** is different from the original one. By default, a new file with the name **MirrorSupport** (in the same folder as **Support**) will be created.

[10] Click **OK**. If a warning appears, click **Cancel**.

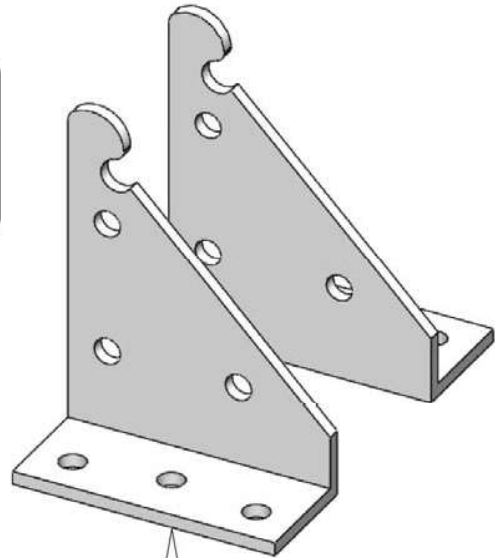


### 3.3-9 Unfix the Supports



[1] In the **Features Tree**, an **(f)** sign before **Support** indicates that it is fixed.

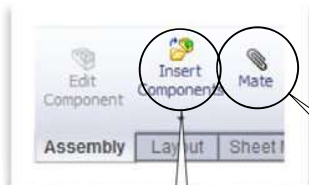
[2] Right-click **Support** and select **Float** from the **Context Menu**. The **(f)** sign turns to **(-)**, indicating that **Support** is not fixed now.



[3] Using your mouse, drag the original **Support** so that the original and the mirrored **Supports** separate from each other like this.



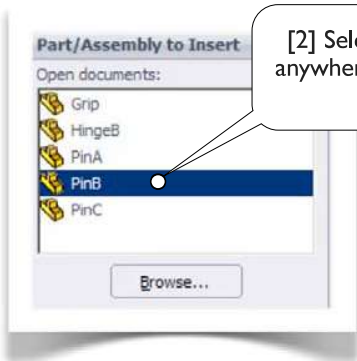
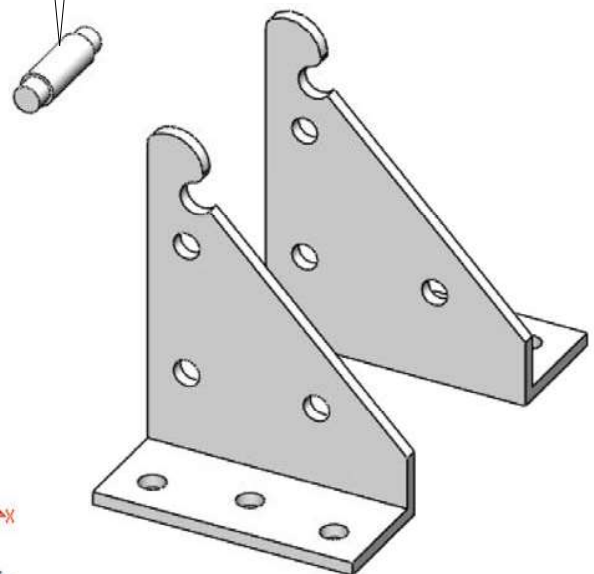
### 3.3-10 Assemble Two PinBs



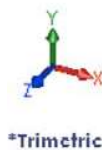
[1] In the **Assembly Toolbar**, click **Insert Components**.

[4] Click **Mate**.

[3] Hold the **Control** key and click-and-drag **PinB**. Another **PinB** is duplicated.



[2] Select **PinB** and park anywhere in the **Graphics Area**.





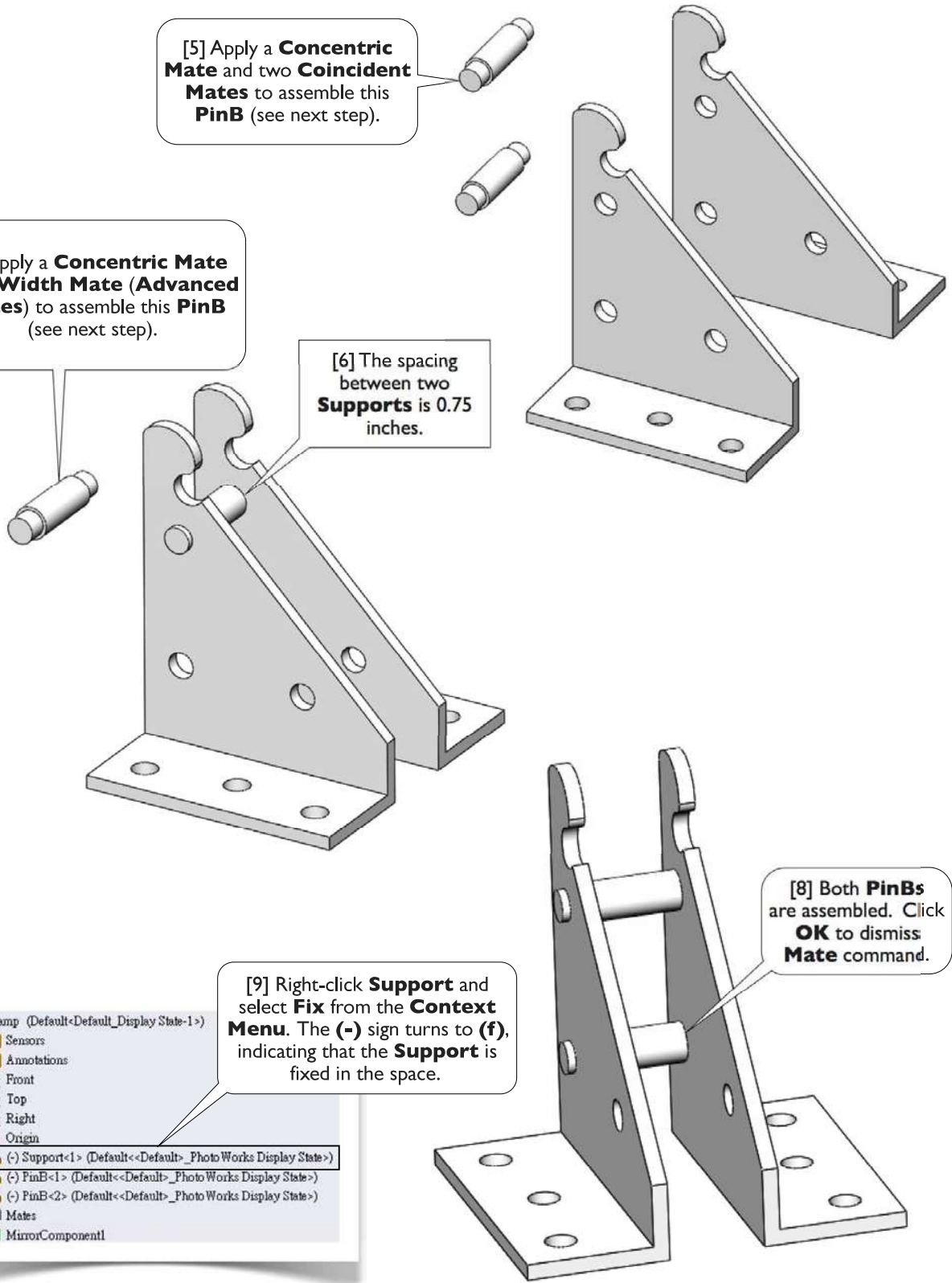
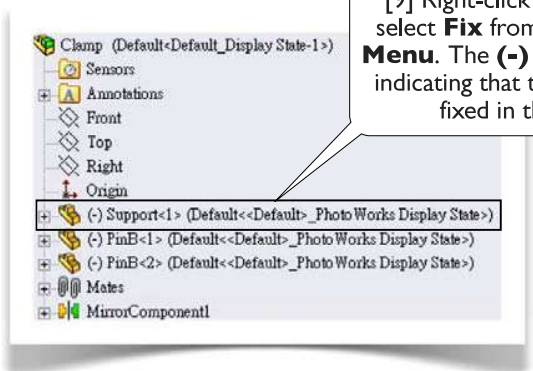
[5] Apply a **Concentric Mate** and two **Coincident Mates** to assemble this **PinB** (see next step).

[7] Apply a **Concentric Mate** and a **Width Mate (Advanced Mates)** to assemble this **PinB** (see next step).

[6] The spacing between two **Supports** is 0.75 inches.

[8] Both **PinBs** are assembled. Click **OK** to dismiss **Mate** command.

[9] Right-click **Support** and select **Fix** from the **Context Menu**. The **(-)** sign turns to **(f)**, indicating that the **Support** is fixed in the space.

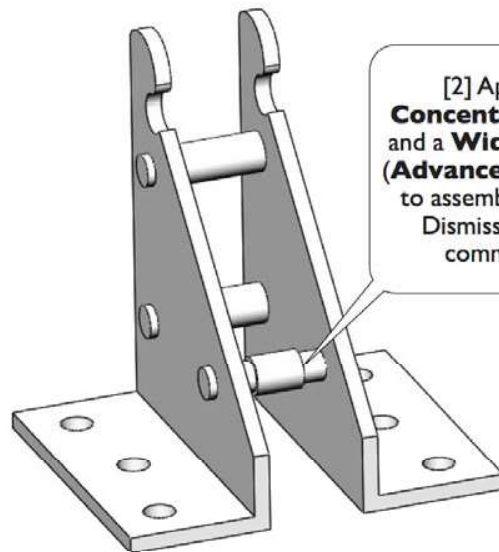




### 3.3-11 Assemble PinC



[1] In the **Assembly Toolbar**, click **Insert Components**, select **PinC** and park anywhere in the **Graphics Area**.



[2] Apply a **Concentric Mate** and a **Width Mate (Advanced Mates)** to assemble **PinC**. Dismiss **Mate** command.

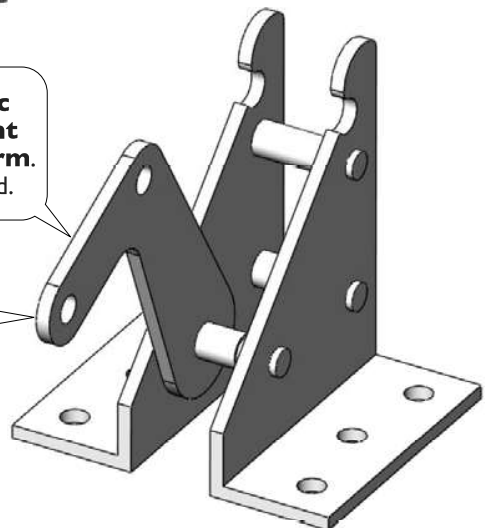
### 3.3-12 Assemble Arms



[1] In the **Assembly Toolbar**, click **Insert Components**, browse and open **Arm**, which was saved in Section 1.1, and park anywhere in the **Graphics Area**.

[2] Apply a **Concentric Mate** and a **Coincident Mate** to assemble the **Arm**. Dismiss **Mate** command.

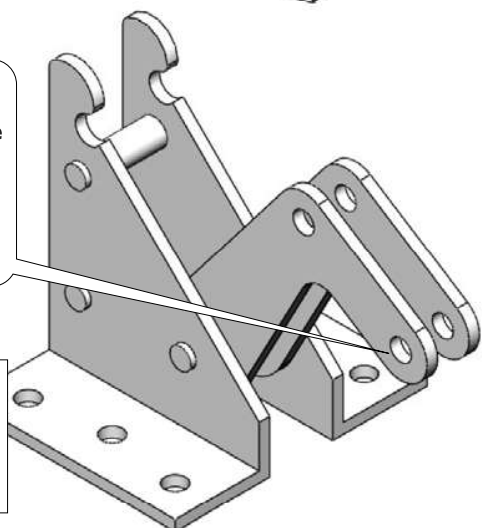
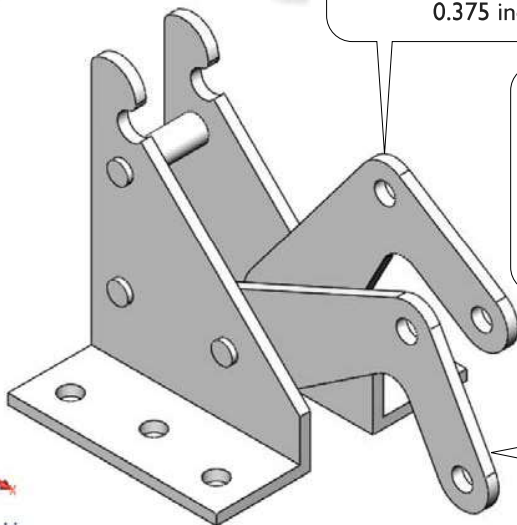
[3] Hold the **Control** key and click-and-drag **Arm**. Another **Arm** is duplicated.



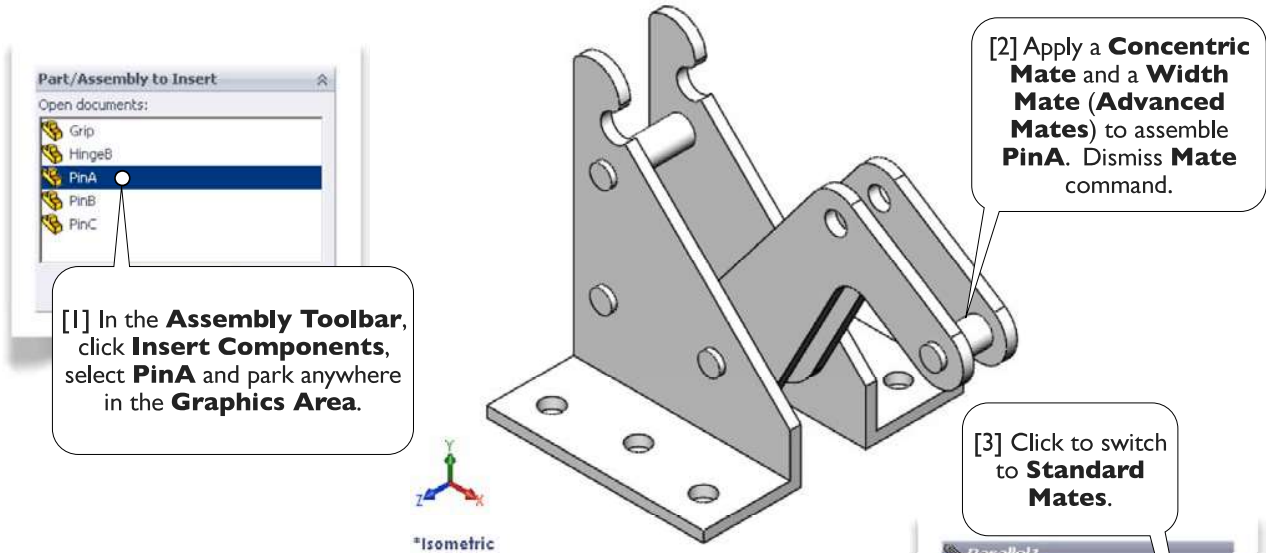
[4] Repeat step [2] for the new **Arm**. Note that the spacing between two **Arms** is 0.375 inches.

[6] Create a **Concentric Mate** so that the two **Arms** align with each other. Dismiss **Mate** command.

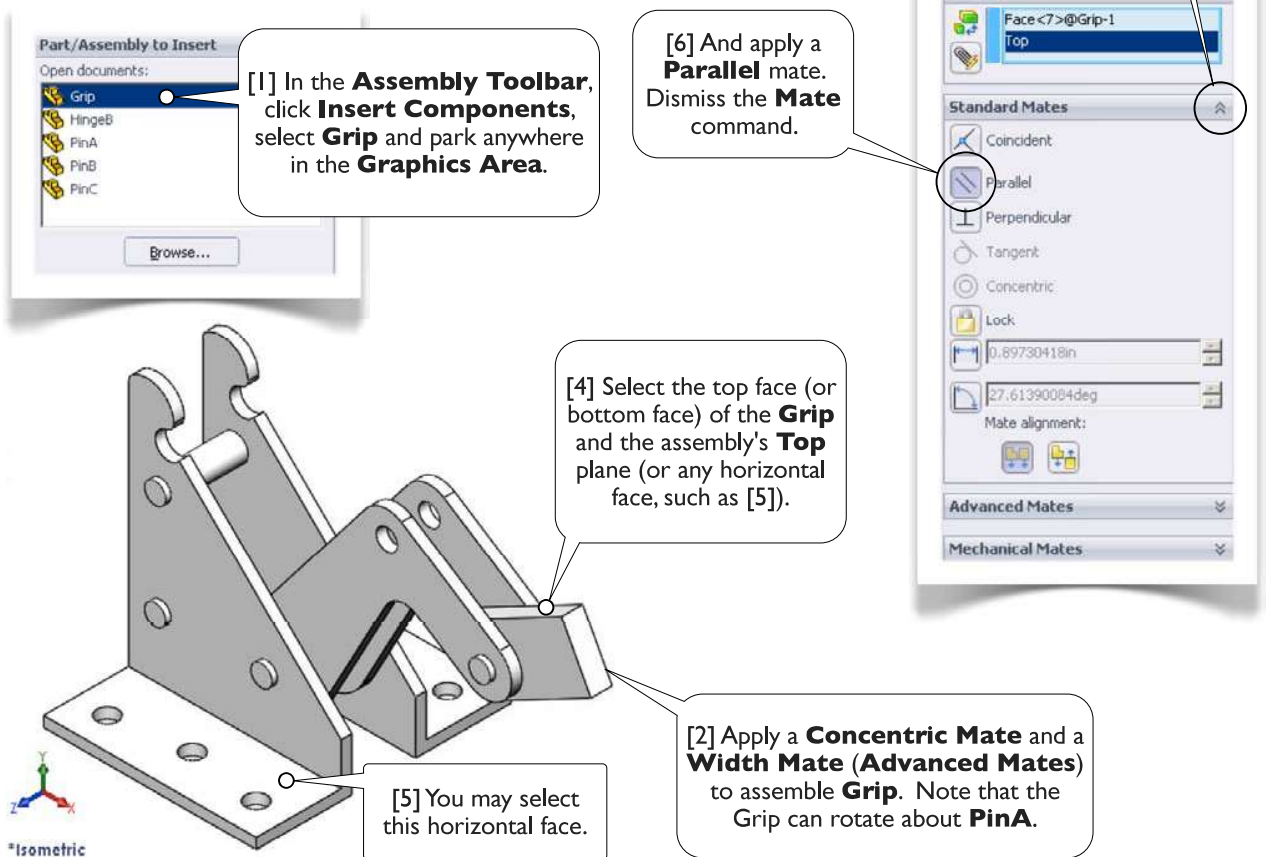
[5] Note that each **Arm** can rotate about the **PinC**.

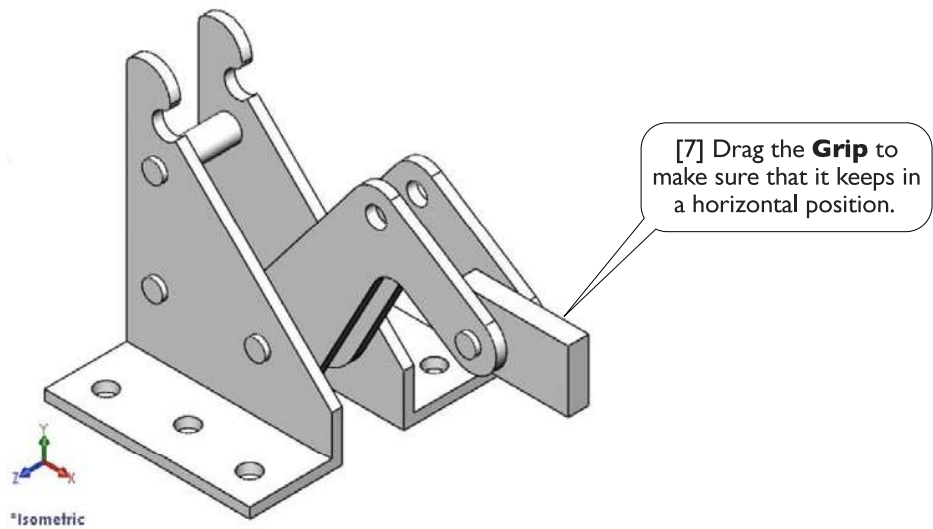


### 3.3-13 Assemble PinA

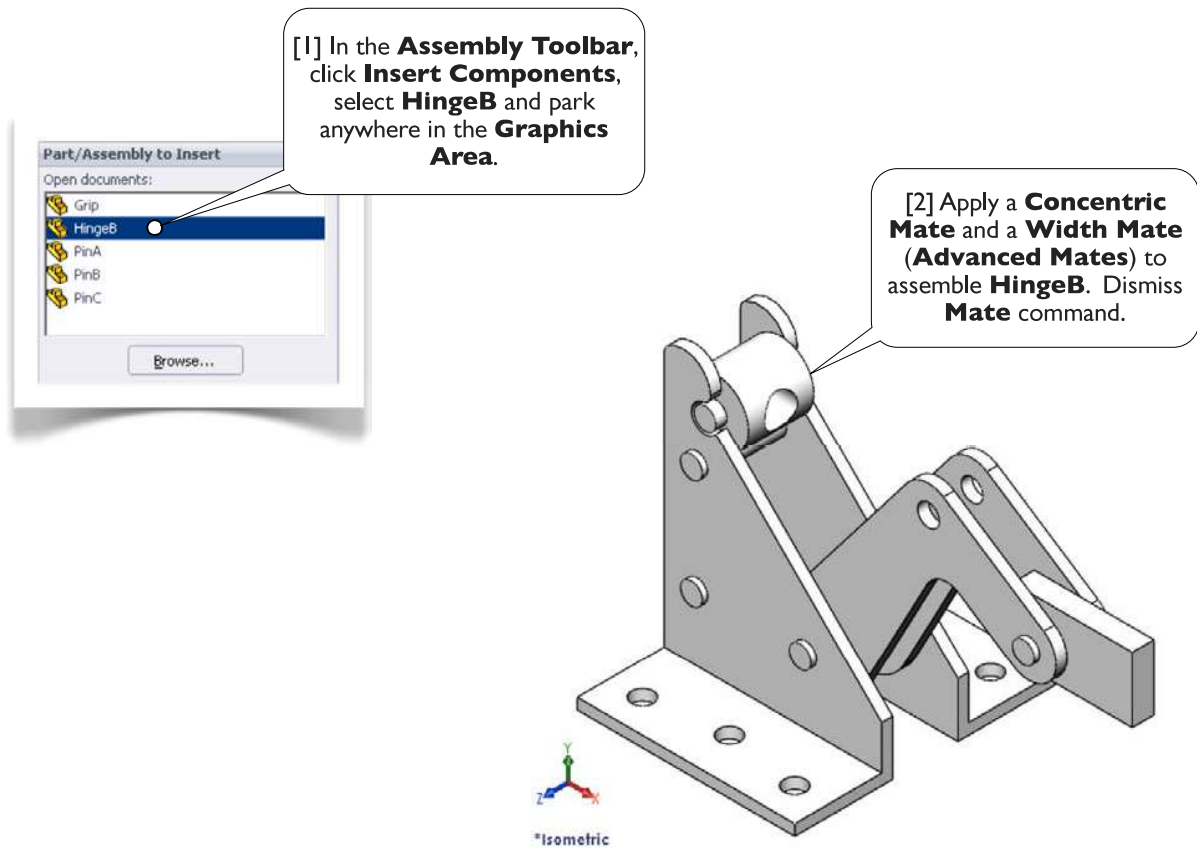


### 3.3-14 Assemble Grip





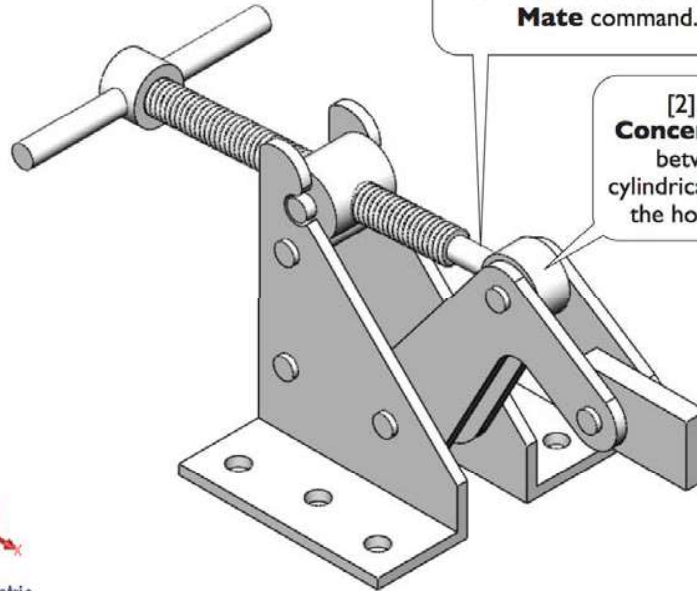
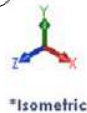
### 3.3-15 Assemble **HingeB**



### 3.3-16 Assemble **ShaftAssembly**



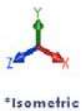
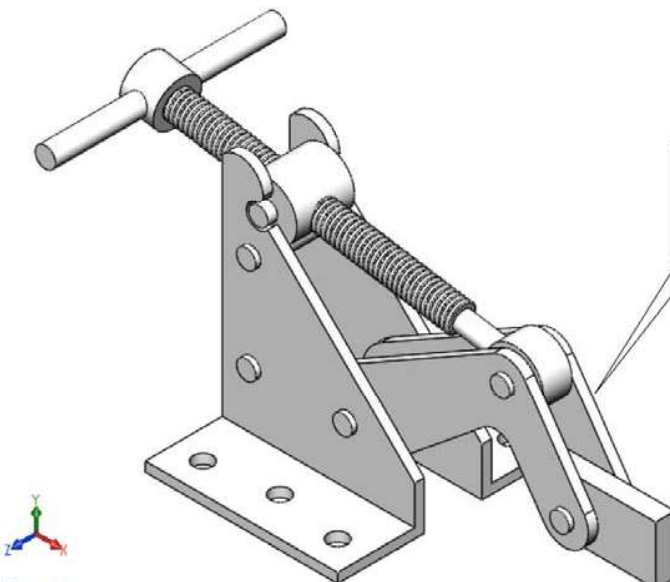
[1] In the **Assembly Toolbar**, click **Insert Components**, browse and open **ShaftAssembly**, which was saved in Section 3.1, and park anywhere in the **Graphics Area**.



[3] And apply a **Concentric Mate** between the hole of **HingeB** and a cylindrical surface of **Shaft**. Dismiss **Mate** command.

[2] Apply a **Concentric Mate** between this cylindrical surface and the hole in **Arm**.

### 3.3-17 Test the Clamping Mechanism



[1] Drag any component to see how the mechanism works. Note that the **Grip** keeps horizontal.

[2] Save the assembly with the file name **Clamp**. Exit **SolidWorks**.

