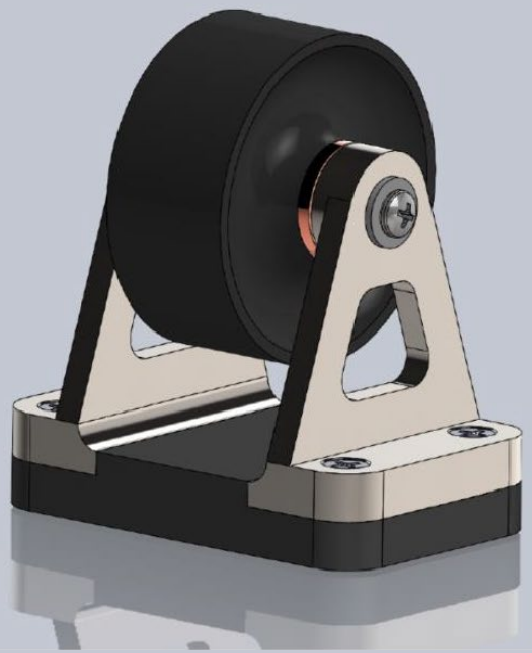
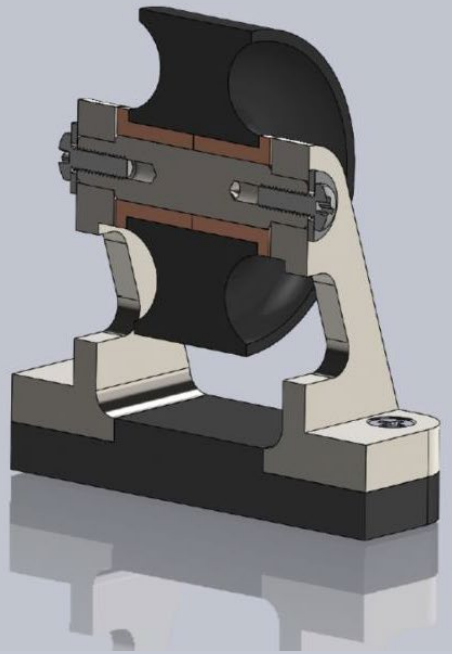
SolidWorks 3, Assembly of a Castor

Part ID	Part name	QTY.
1	Base	1
2	Bracket	2
3	Bushing	2
4	Roller	1
5	Shaft	1
6	Washer 98026A029	2
7	Rounded Head screws 90272A540	2
8	Flat Head Screws 90273A542	4

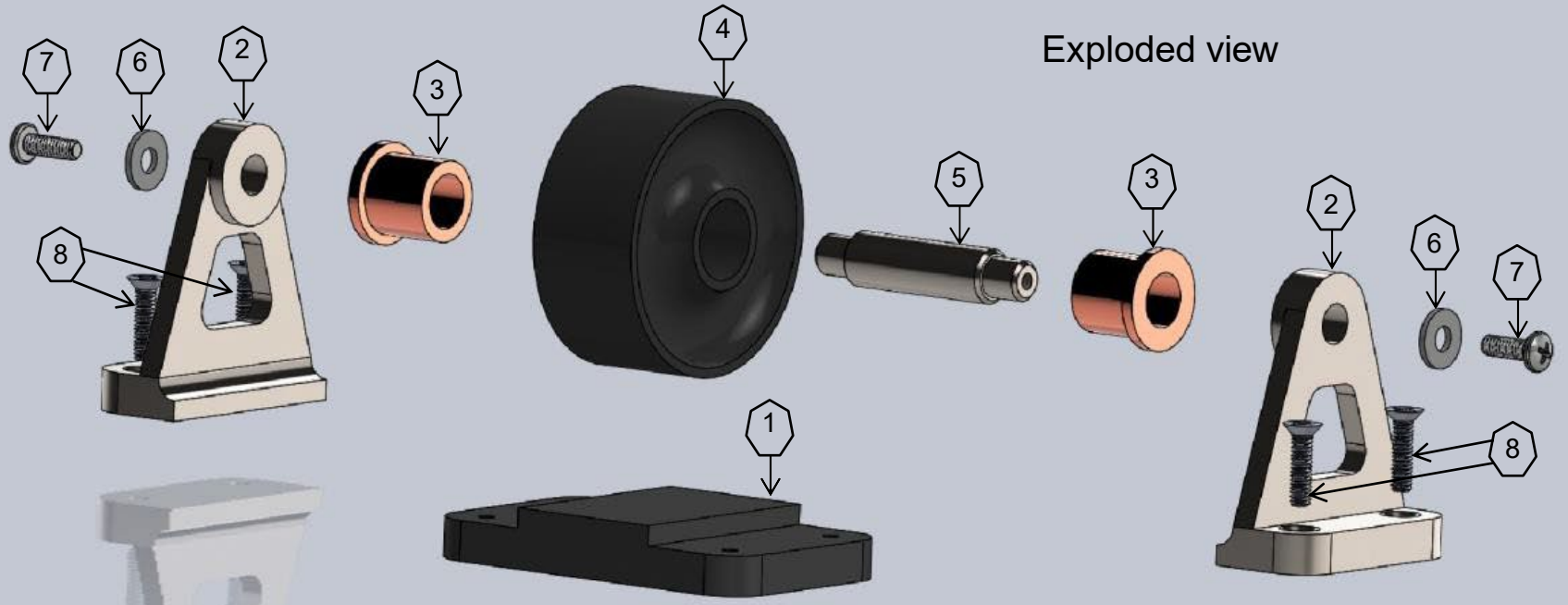
Isometric view

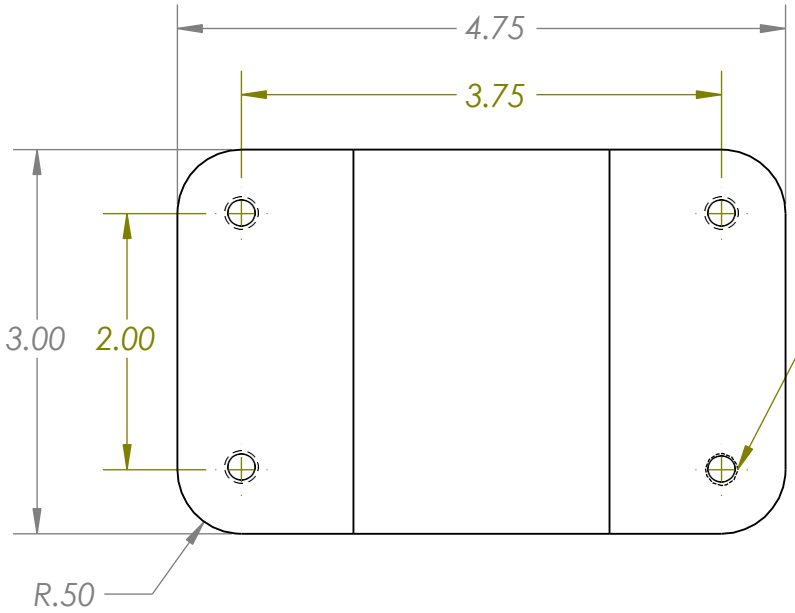


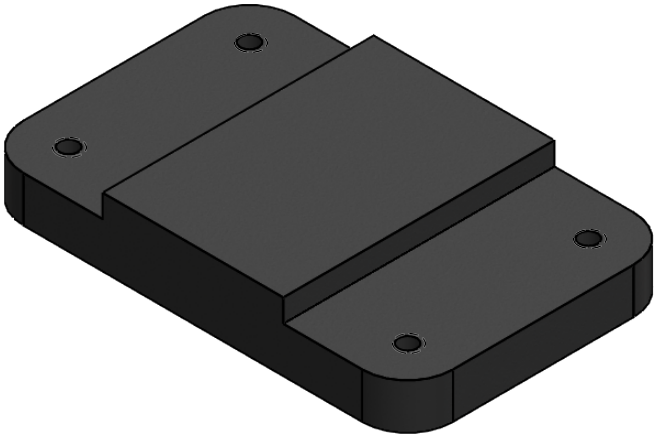
Section view

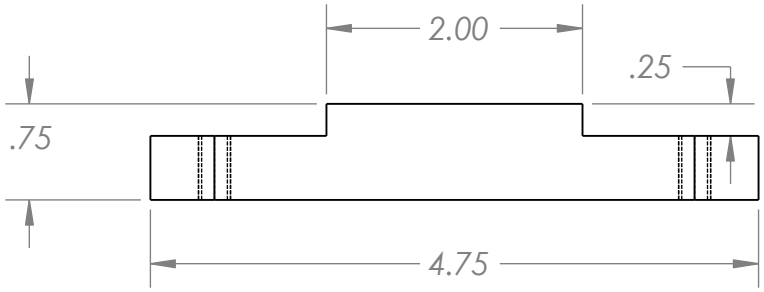


Exploded view

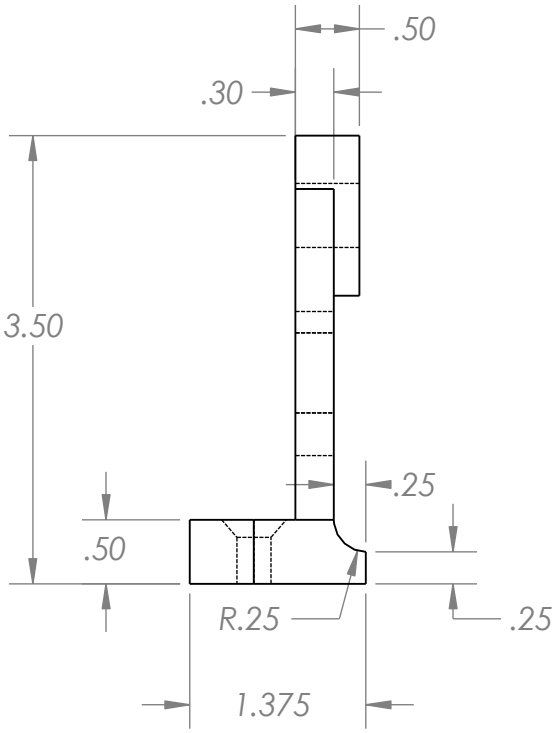


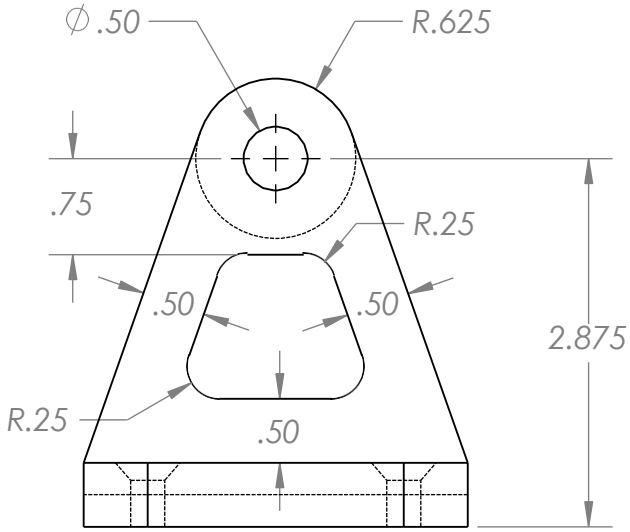


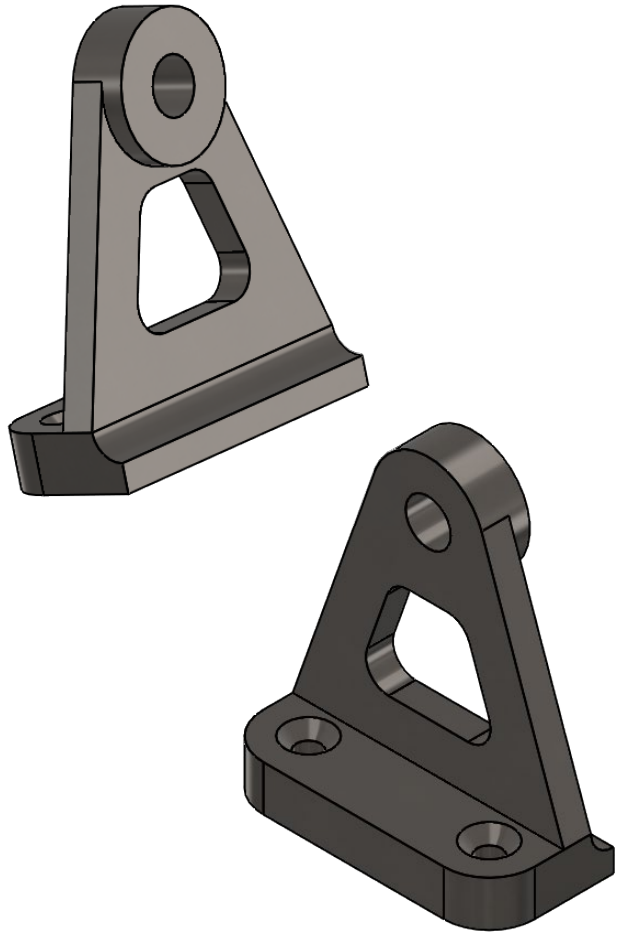


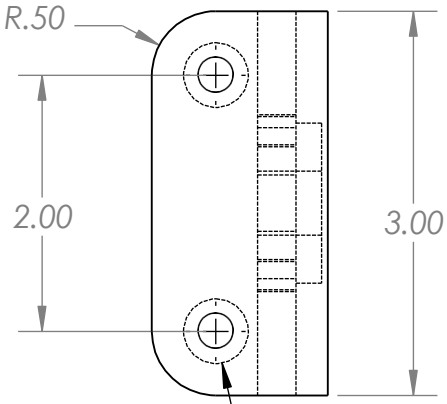


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:			DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING / REVISION
						Units are IPS
	NAME	SIGNATURE	DATE			TITLE:
DRAWN						
CHK'D						
APPV'D						
MFG						
Q.A				MATERIAL: **Gray cast iron**		DWG NO. Base Drawing / A4
				WEIGHT:		SCALE:1:2 / SHEET 1 OF 1



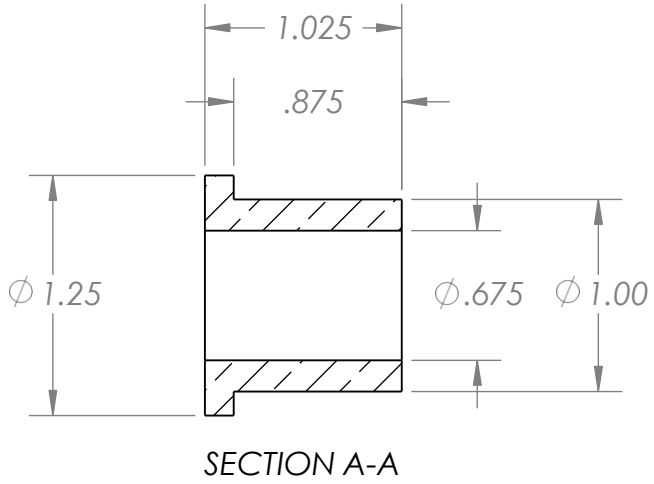




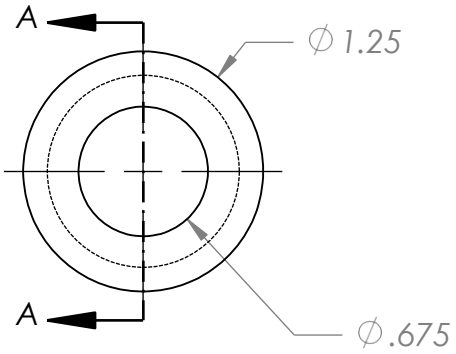


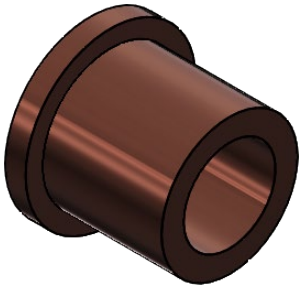
1/4 Countersink
Flat Head Screw (82)

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:	FINISH:		DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION	
				Units are IPS		
	NAME	SIGNATURE	DATE	TITLE:		
DRAWN						
CHK'D						
APPV'D						
MFG						
Q.A				MATERIAL: **Stainless Steel (Ferritic)**	DWG NO. **Bracket Drawing**	A4
				WEIGHT:	SCALE:1:2	SHEET 1 OF 1

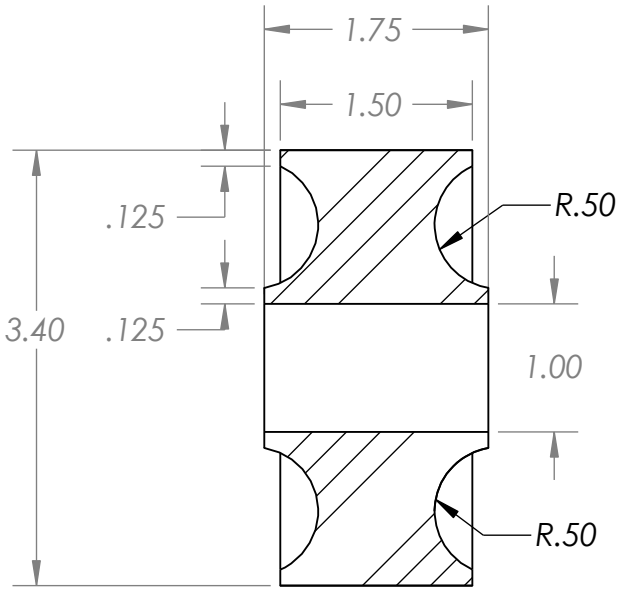


SECTION A-A

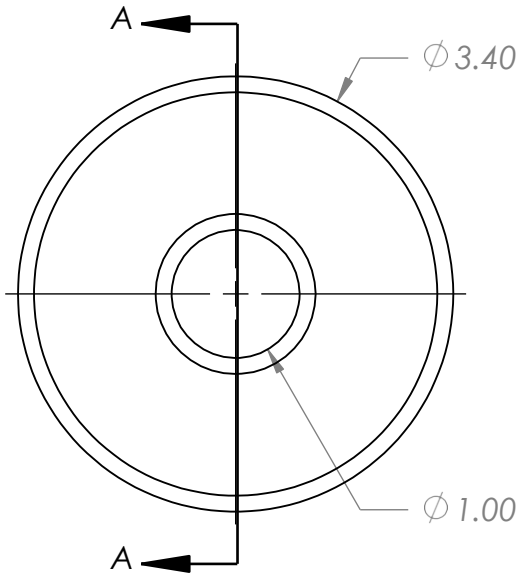




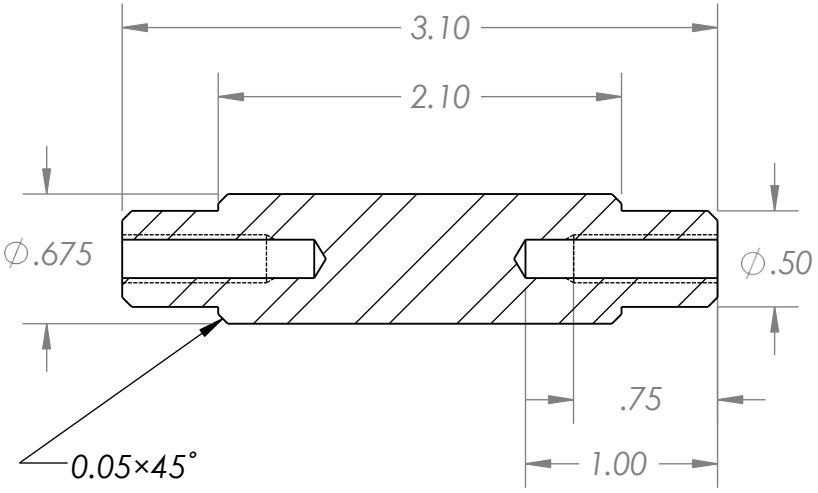
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:			DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION
						Units are IPS	
	NAME	SIGNATURE	DATE			TITLE:	
DRAWN							
CHK'D							
APPV'D							
MFG							
Q.A				MATERIAL: **Copper**		DWG NO. Bushing Drawing	A4
				WEIGHT:		SCALE:1:1	SHEET 1 OF 1



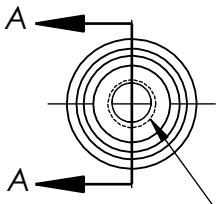
SECTION A-A
SCALE 1 : 1.5



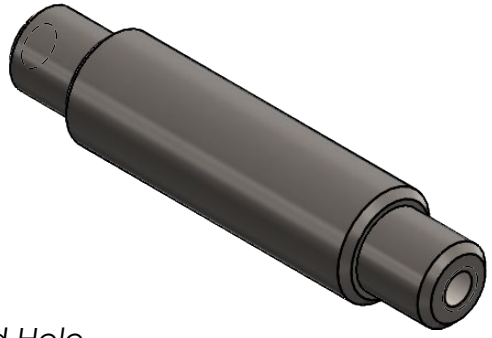
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:			DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION
						Units are IPS	
	NAME	SIGNATURE	DATE			TITLE:	
DRAWN							
CHK'D							
APPV'D							
MFG							
Q.A				MATERIAL:		DWG NO.	A4
				Silicon Rubber		Roller Drawing	
				WEIGHT:		SCALE:1:2	SHEET 1 OF 1



SECTION A-A

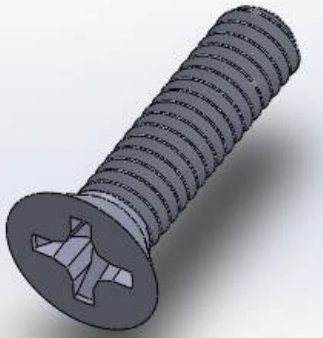


1/4-20 Tapped Hole
Hole depth 1, Thread depth 0.75

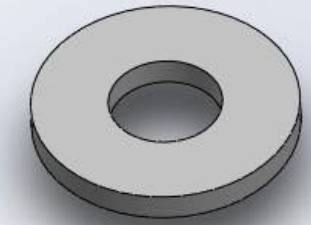


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:			DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION
						Units are IPS	
	NAME	SIGNATURE	DATE			TITLE:	
DRAWN							
CHK'D							
APPV'D							
MFG							
Q.A				MATERIAL: **Stainless Steel (Ferritic)**		DWG NO. **Shaft Drawing**	A4
				WEIGHT:		SCALE:1:1	SHEET 1 OF 1

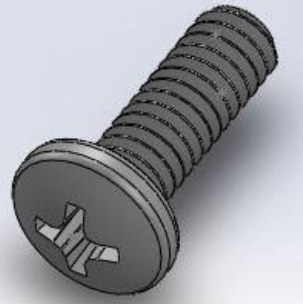
The Solidworks designs of the following parts can be downloaded from McMaster Carr website



Flat Head Screws
McMaster
Part# 90273A542



Washer
McMaster Carr
Part# 98026A029



Rounded Head Screws
McMaster Carr
Part# 90272A540

Steps for Assembly

1) Once you start a new assembly, insert the **Base** as the first part.
2) In this step, we want to align the local X-Y-Z coordinate system of this Base with the global X-Y-Z coordinate system of the entire assembly. To realize this, we need to mate the local front plane, top plane, and right plane of the Base with the global front plane, top plane, and right plane of the assembly. Before the mates of the three pairs of planes can be done, we will need to enable this part to float; otherwise it is fixed. To do so, right click the Base in the feature tree, and then select "**Float**". After performing the mates between the two front planes, two top planes, and two right planes, respectively, the local X-Y-Z coordinate system of this Base is aligned with the global X-Y-Z coordinate system of the assembly. Now we can change this part from float back to fix (by right clicking the Base in the feature tree, and then selecting "**Fix**").
3) In this step, we will assemble the two **Brackets** with the **Base**. Insert two of the Bracket components. To assemble each Bracket with the Base, we can perform three mates: mate the bottom surface of the Bracket with the corresponding top surface on the Base (Coincident mate), and mate the holes on the Bracket with the holes on the Base (Concentric mate).
4) In this step, we will assemble the **Shaft** between the two **Brackets**. Insert the component of Shaft. To assemble this Shaft with the two Brackets, we can first mate the exterior round surface of one end of the Shaft with the interior round surface of the hole in a Bracket (Concentric mate), and then we can use the **Width** mate in the **Advanced Mates** to place the Shaft at exactly the middle of the two Brackets. The Width mate constrains a tab between two planar faces.
5) In this step, we will assemble the **Roller** on the **Shaft**. To achieve this, we can first mate the interior round surface of the hole in the Roller with the exterior round surface of the Shaft (Concentric mate),and then use the **Width** mate in the **Advanced Mates** to place the Roller at the exact center of the Shaft.
6) In this step, we will assemble the two **Bushings**. Insert two of the Bushing components. To assemble each Bushing, many ways can be followed. For example, we can mate two surfaces on the Bushing with the corresponding surfaces on the Roller (Concentric mate). Note that you can also consider using Coincident mates, depending on how you approach this.
7) In this step, we will assemble the two **Washers**. To assemble each washer, we can perform a coincident mate between the flat surface of the washer and the corresponding surface on the Bracket, and then perform a concentric mate between the hole of the washer and the hole at the end of the Shaft.
8) In this step, we will assemble the two **Rounded Head Screws**. To assemble each screw, we can perform a coincident mate between the flat surface on the screw and the corresponding surface on the washer, and then perform a concentric mate between the end circle of the screw and the hole in the Shaft.
9) In this step, we will assemble the four **Flat Head Screws**. To assemble each screw, we can mate the Countersink surfaces (in this way, one mate can finish this step of assembly).

By this step, all the parts have been assembled. To ensure that every part is assembled perfectly, we can apply a **Section View** before checking. Consider running an interference detection (see supplementary document on Interference Detection in Supplementary Help)

You can notice that the assembly is still "under defined". This is reasonable as many parts (e.g. the Roller) in this assembly can still move which is its designed function.

Brief Steps to Set an Exploded View

1) Click "**ConfigurationManager**", right select the assembly that you just created (e.g. Default [Castor Assembly]) and then click "**New Exploded View**".
2) Select each part and then pull along the direction we want. We can also select a group of parts and move them together.
3) After all the explode steps are done, click OK.
4) We can now view this assembly in either Explode version or the Collapse version (by right click ExplView1, select either "Collapse" or "Explode").
   We can also view the "Animate collapse" or "Animate Explode" as a video.
   To save the animation, we can save it as an AVI or other file type.