

Activity: Cylinder Head subassembly

In this activity, you will create a subassembly that will incorporate the cylinder base, the cylinder head and the cylinder head top subassembly. These components will be constrained to each other.



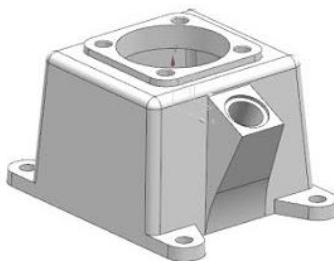
 Launch the [Cylinder Head subassembly](#) activity.

Cylinder Head subassembly

1 of 3

Start a subassembly

1. Create a new model, in millimeters, named `***_assembly_cylinder_head`, where `***` are your initials.
2. Add the `des05_ac_compressor_base` as the first component to the empty subassembly.
 - Position the component at the absolute origin.



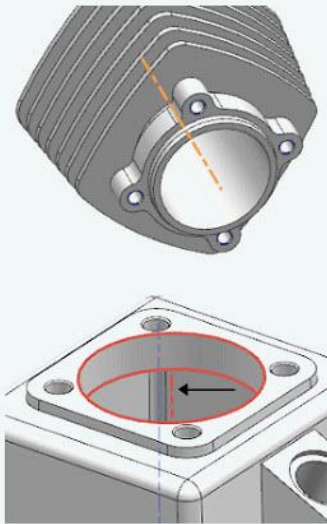
- Set **Reference Set** to **Model**.
- Click **OK** to add the component.
- Apply a **Fix** Assemblies tab→Component Position group→Assembly Constraints constraint to the component base.

Cylinder Head subassembly

2 of 3

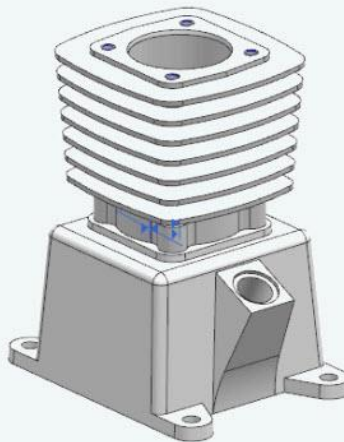
Add the cylinder head

1. Add part *des05_ac_cylinder_head* to the cylinder assembly as a component.
 - Make sure the cylinder head is aligned vertically to the base.



- Make sure the cylinder head is touching the pad of the base.
- Make sure that the cylinder head is constrained so it cannot rotate along its cylindrical axis.

The component should be fully constrained.

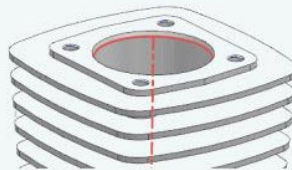
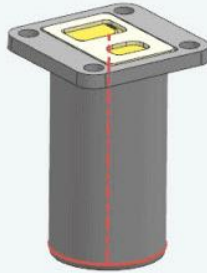


Cylinder Head subassembly

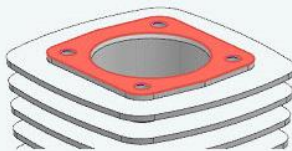
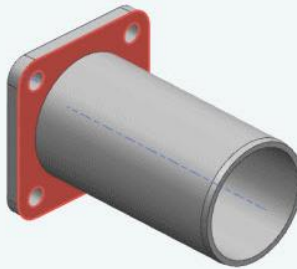
3 of 3

Add the cylinder head top subassembly

1. Add subassembly *des05_ac_cylinder_head_top_assembly* to the cylinder assembly.
 - Make sure the top subassembly is aligned vertically to the cylinder head.

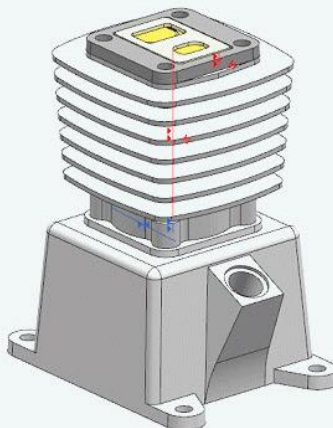


- Make sure the top subassembly is touching the top pad of the cylinder head.



- Make sure that the cylinder head is constrained so it cannot rotate along its cylindrical axis.

The component should be fully constrained.



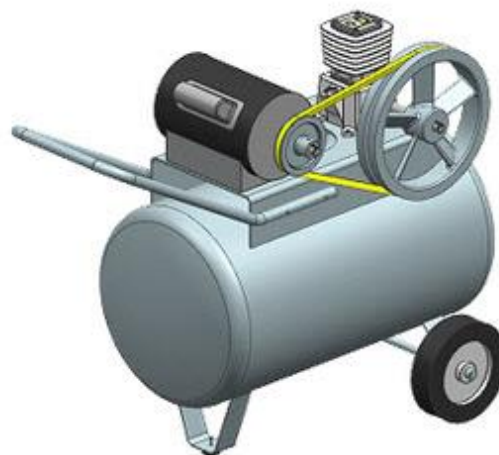
2. Save and close the assembly file.

You completed the activity.

Essentials for NX Designers – Activities

Activity: Compressor assembly

In this activity, you will fully assemble and constrain various component parts and subassemblies of the compressor.



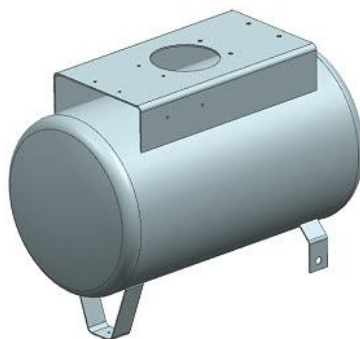
Launch the **Compressor assembly** activity.

Compressor assembly

1 of 7

Start the assembly

1. Create a new model, in millimeters, named `***_main_assembly`, where `***` are your initials.
2. Add your `***_tank` as the first component to the empty assembly.
 - Position the component at the absolute origin.



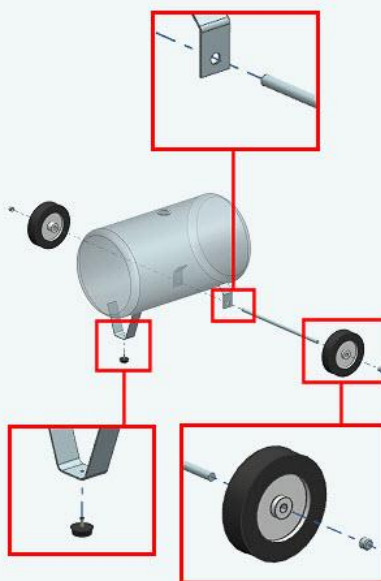
- Set **Reference Set** to **Model**.
- Click **OK** to add the component.
- Apply a **Fix** Assemblies tab→Component Position group→Assembly Constraints constraint to the tank.

Compressor assembly

2 of 7

Add the first components

1. Use **Add Component** to add and constrain the axle, wheels and end caps.
 - Use the *des05_ac_wheel_200mm* part for the wheels.
 - Use the *des05_ac_axle* part for the axle.
 - Use the *des05_ac_axle_cap* part for the end caps.
 - Use the *des05_ac_foot_pad* part for the pad on the bottom of the front foot.



- To center and constrain the axle to the tank legs, use the **Center** constraint with the **2 to 2** subtype, centering the two axle end faces to the outside faces of the legs.



- Alignment constraints can be accomplished with **Touch Align**, using **Prefer Touch** and **Infer Center/Axis**.



Compressor assembly

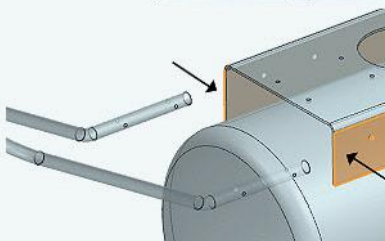
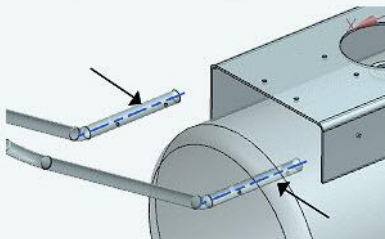
3 of 7

Add the handle to the tank

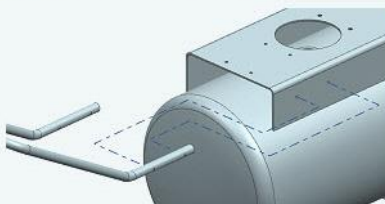
1. Use **Add Component** to add your ****_handle* to the tank.

If you did not model the handle, use the handle master part, *des05_ac_handle_mstr*.

- o To center the handle to the tank, use the **Center** constraint with the **2 to 2** subtype, centering the two tubular center lines to the outside faces of the tank base.



- o After the handle is centered, align the screw holes in the handle to those on the tank base.

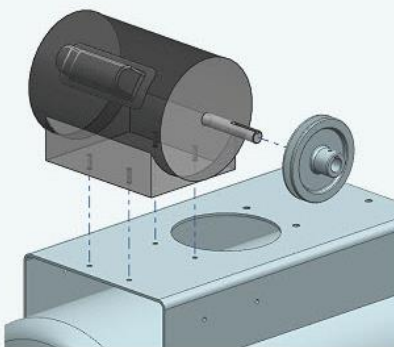


Compressor assembly

4 of 7

Add the motor and the pulley to the tank base

1. Use **Add Component** to add the *des05_ac_motor_electric* part to the tank.
 - Align the attachment holes of the motor to the corresponding holes in the base of the tank.
 - The component should be fully constrained.



2. Add your ****_pulley_01* part to the shaft of the electric motor.
If you did not model the pulley, use the pulley master part, *des05_ac_pulley_mstr*.
 - Align the axis and keyway of the pulley to the shaft of the electric motor axis and keyway.
 - The pulley must be able to slide on the shaft until the pulley wheel and the flywheel are aligned later.

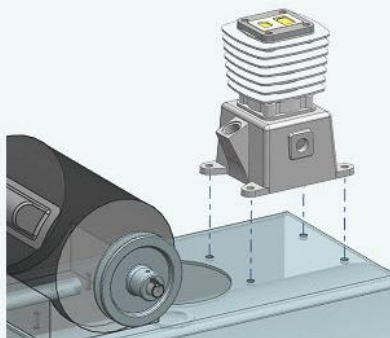
Compressor assembly

5 of 7

Add the cylinder head subassembly

1. Add and constrain your `***_assembly_cylinder_head` to the tank.

If you did not model the cylinder head subassembly, use the subassembly master part, `des05_ac_cylinder_head_assembly_mstr`.



- Align the attachment holes of the subassembly to the corresponding holes on the base of the tank.
- This component should be fully constrained.

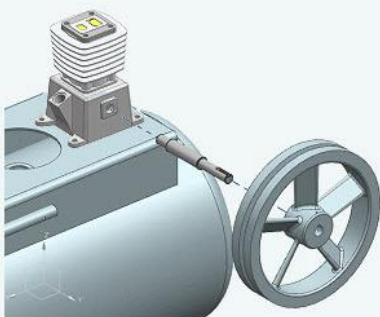
Compressor assembly

6 of 7

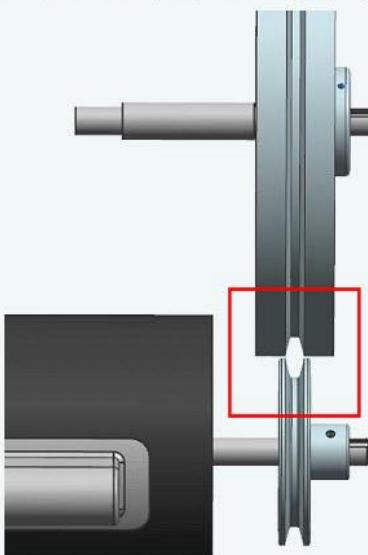
Add the flywheel and shaft

1. Add and constrain your ****_flywheel* and *des05_ac_compressor_shaft* to the tank.

If you did not model the flywheel, use the master part, *des05_ac_flywheel_mstr*.



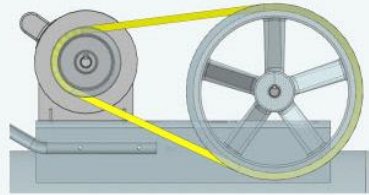
- When applying the constraints, remember that the flywheel and the compressor shaft act as one unit and must be free to rotate when constrained to the compressor base.
- The flywheel must be able to slide on the shaft until the pulley wheel and the flywheel are aligned.
- Use a **Center** constraint, **2 to 2** subtype for aligning both the flywheel to the pulley and for aligning keyways.



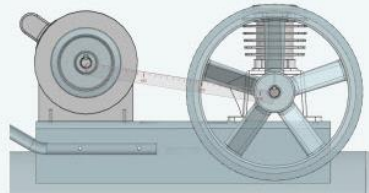
Add the belt

1. Add and constrain your *****_belt** to the pulley and the flywheel.

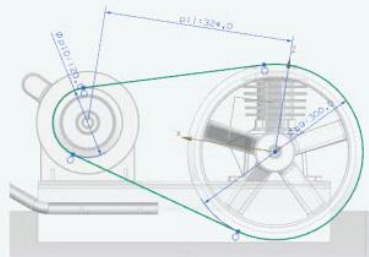
If you did not model the belt, use the belt master part, *des05_ac_belt_mstr*.



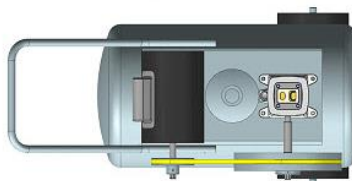
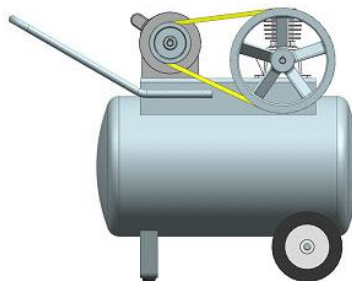
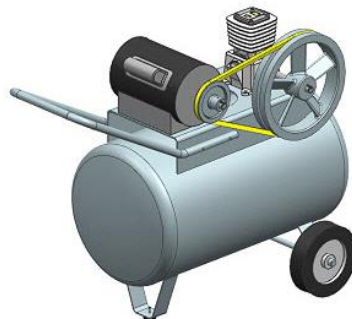
- If you choose to use the *des05_ac_belt_mstr* the fit has been determined for you and constraining the belt component will be easy.
- If you use the belt you developed, you will need to do some design-in-context editing to fit the belt to the pulley and the flywheel - you will need to know the distance between the center axes of the motor shaft and the cylinder head shaft.



- You can edit in context by making the belt component the Work Part and editing the sketch that defines the belt path.



2. Your completed assembly should look similar to the illustrations below.

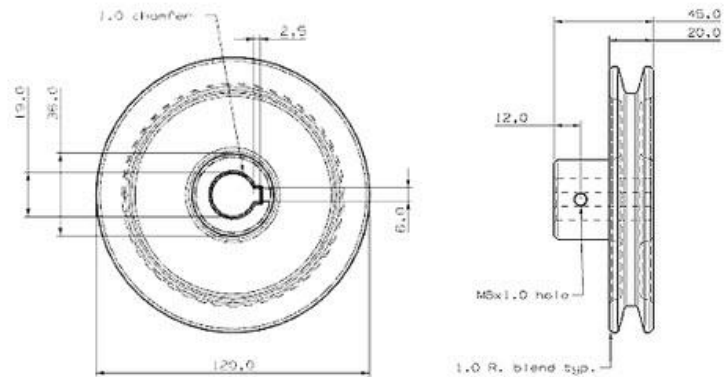


3. Save and close the assembly file.

Essentials for NX Designers – Activities

Activity: Pulley part 6

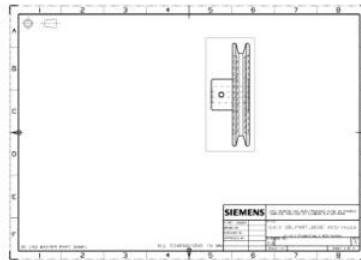
In this activity, you will create a new drafting sheet and create a base view and orthographic view and add key dimensions and notes to the two views.



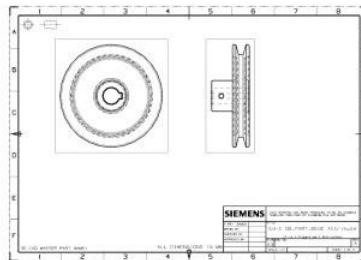
 Launch the **Pulley part 6** activity.

Create a drawing sheet and add notes and dimensions

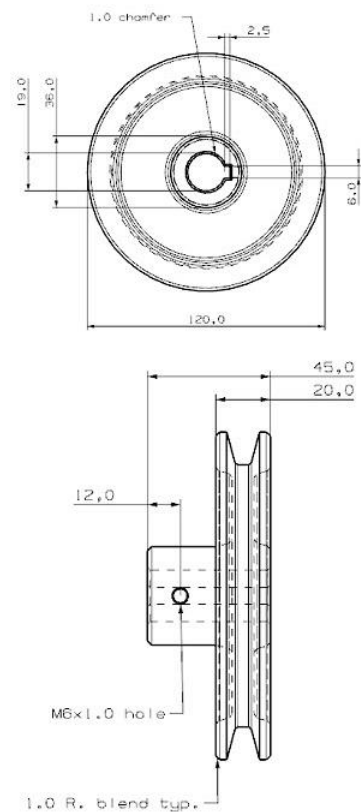
1. Open `***_pulley_01`, where `***` are your initials.
2. Create a new metric non-master drafting file named `***_pulley_01_dwg1`, where `***` are your initials, that references `***_pulley_01`. Use an A-3 drawing template.
3. Add a top view of the pulley, at a scale of 1.



4. Add a left side projection view.



5. Edit the title block as appropriate.
6. Complete by adding notes and dimensions, as shown.



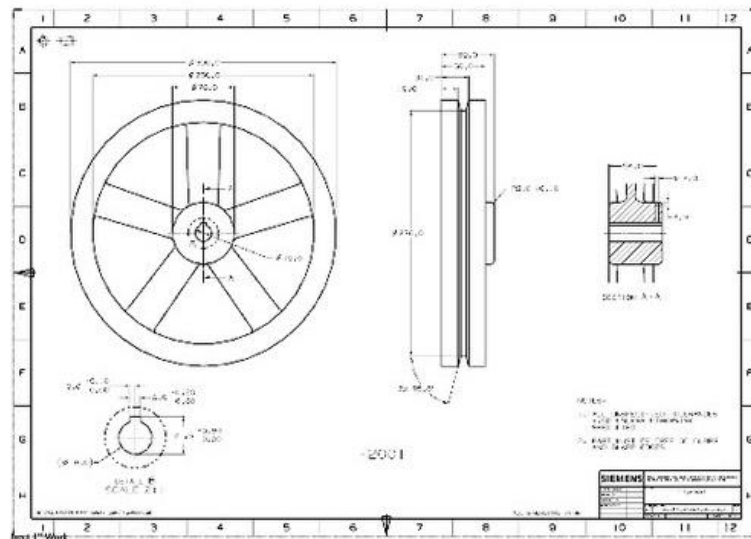
7. Move and align views as needed to optimize fit of views to the sheet.
8. Save and close the file

You completed the activity.

Essentials for NX Designers – Activities

Activity: Flywheel part 6

In this activity, you will practice creating new sheets, views, notes and dimensions.

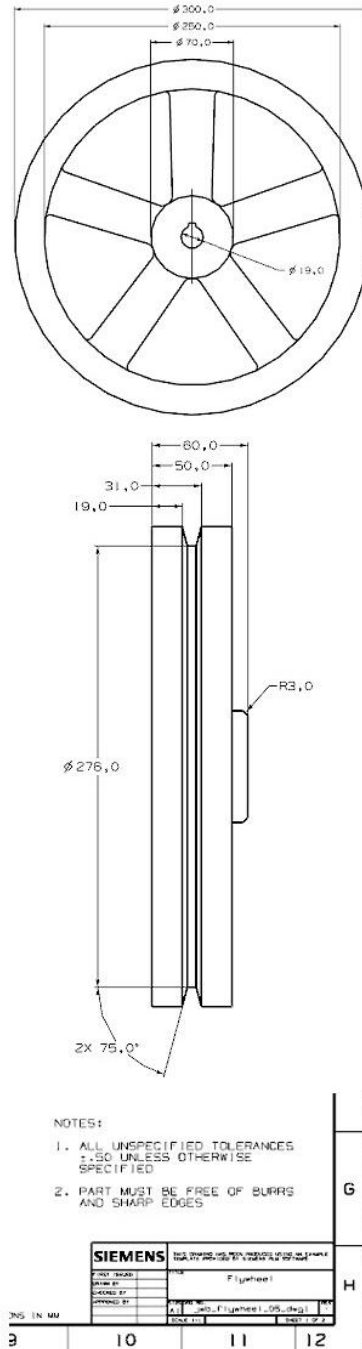


 Launch the **Flywheel part 6** activity.

Click **Exit the course**  below.

Create a drawing sheet and add notes and dimensions

1. Open `***_flywheel_01`, where `***` are your initials.
2. Create a new metric non-master drafting file named `***_flywheel_01_dwg1`, where `***` are your initials, that references `***_flywheel_01`. Use an A-1 drawing template.
3. Add a front view of the flywheel, at a scale of 1:2.
4. Add a right side projection view.
5. Edit the title block as appropriate.
6. Complete by adding notes and dimensions, as shown.



7. Move and align views as needed to optimize fit of views to the sheet.
8. Save and close the file

You completed the activity.