How to change the axis system in CATIA V5

If you want to know how to change the axis system in CATIA V5, you can insert a custom axis system into a Part Design document. This guide shows you how to define its origin, X axis, and reference surface, rotate it by an angle, and reverse individual axis directions. You can then apply the result to your part.

Prerequisites

Before you begin, make sure you have the following:

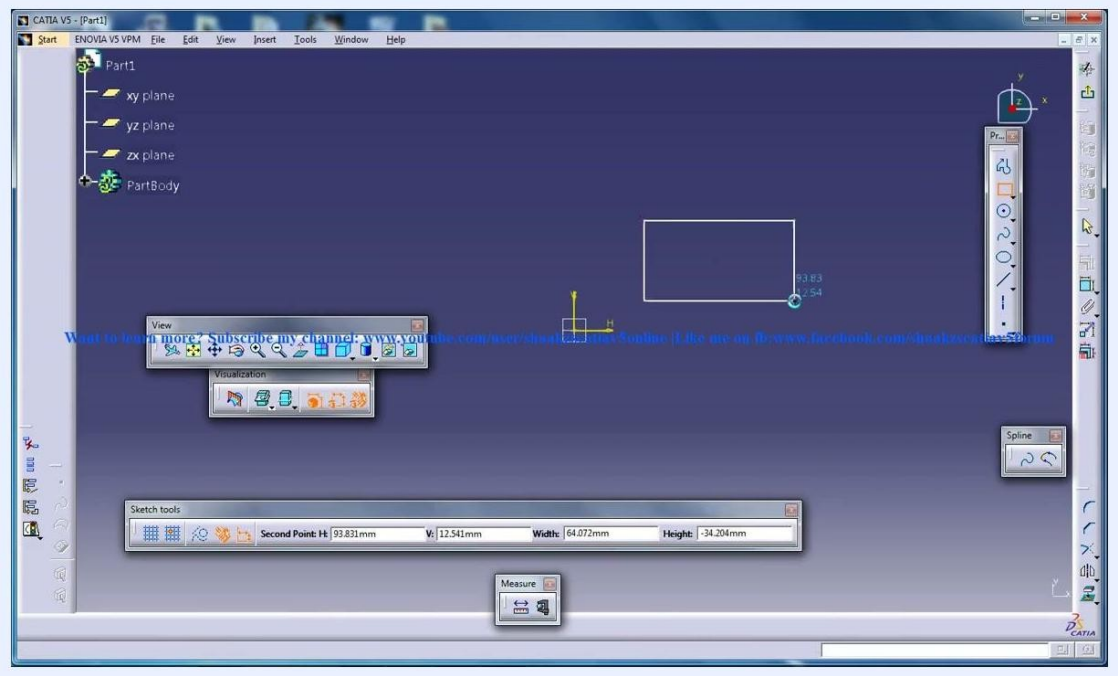
- CATIA V5 installed and ready to launch
- A 3D object in a Part Design document. Step 2 shows you how to create a simple one.

Step 1: Open a new Part Design document

Start CATIA V5 and create a new part document in the Part Design workbench.

1. Launch CATIA V5.
2. Go to **Start** > **Mechanical Design** > **Part Design**.

3. Select **Part Design** to open a new part document.



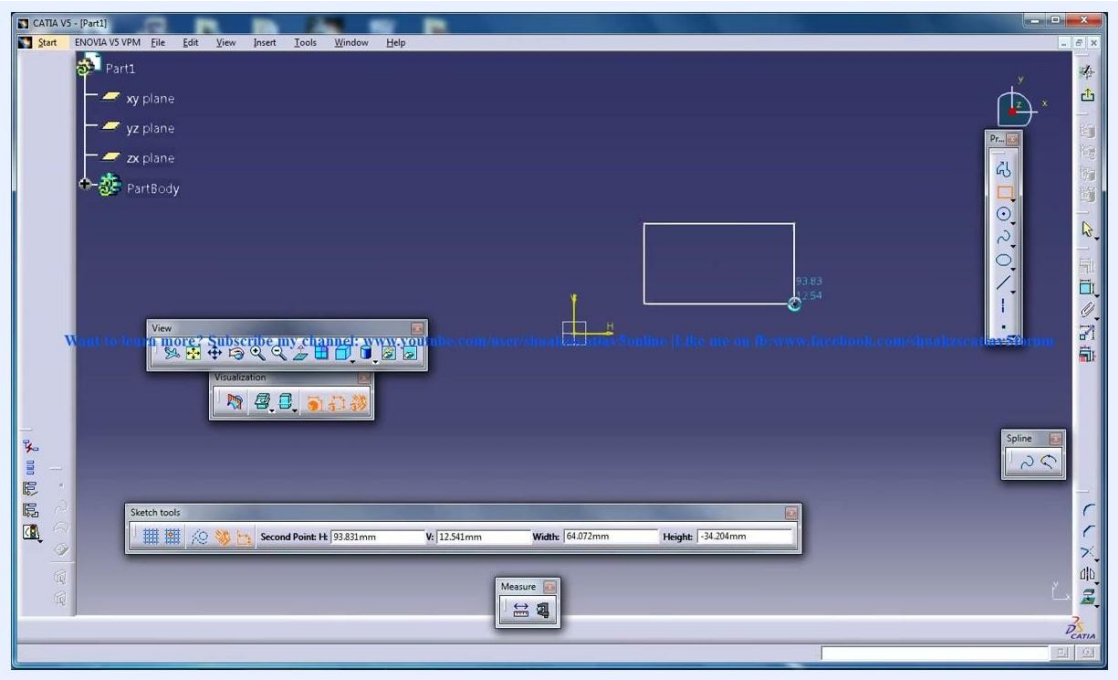
CATIA V5 Start menu with Mechanical Design > Part Design highlighted

Step 2: Create a basic 3D object

Create a simple object that gives you a vertex, an edge, and a face to select later.

1. In the Part Design workbench, create a simple sketch, such as a rectangle.

2. Pad the sketch to form a 3D object. Use the sketch and pad tools as needed.



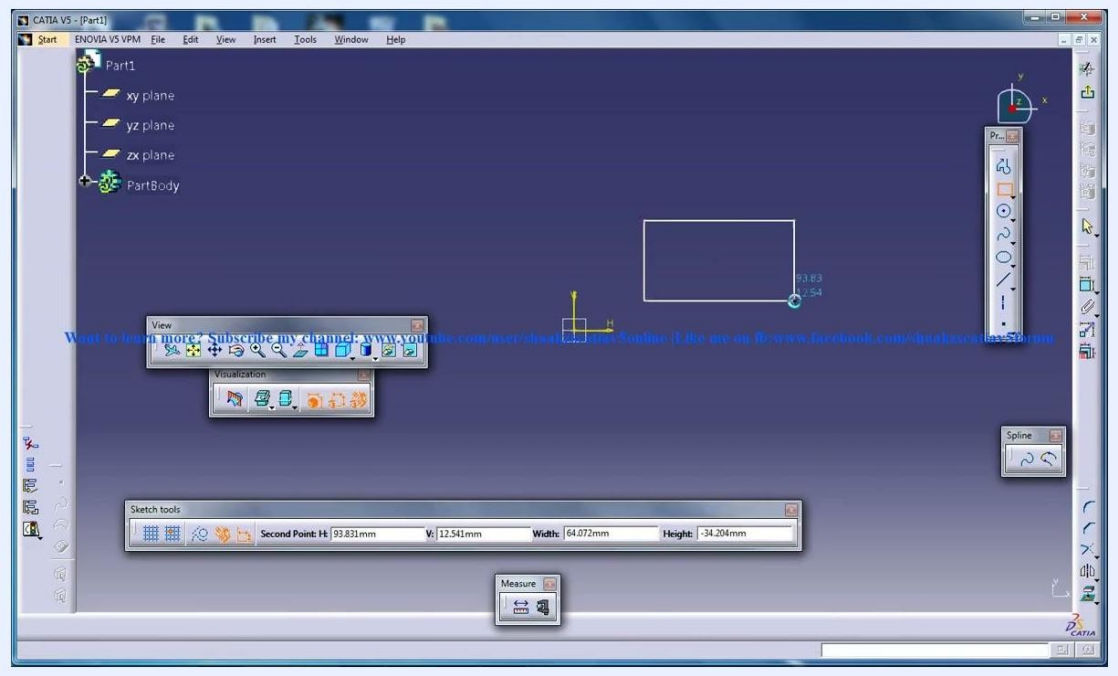
Part Design workbench with a rectangle sketch and the pad tools visible

Step 3: Insert an axis system

Open the Axis System Definition dialog from the top menu.

1. Select **Insert** > **Axis System...**.

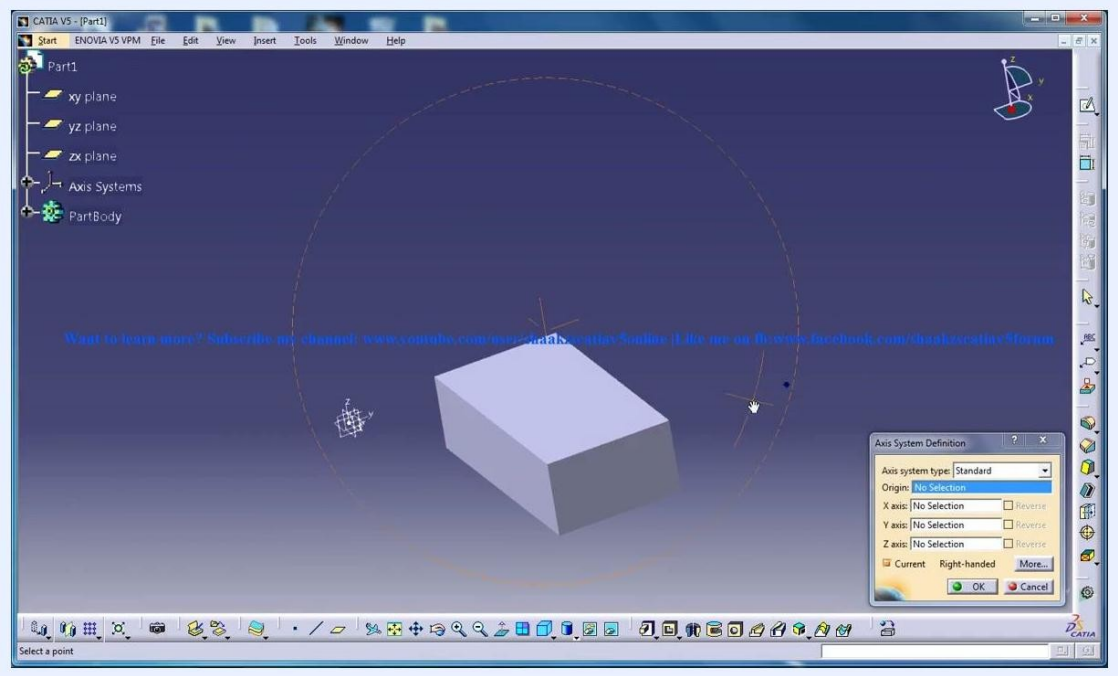
2. The Axis System Definition dialog opens.



Insert menu expanded with the Axis System option visible

Step 4: Set the axis system type to Axis rotation

In the Axis System Definition dialog, set **Axis system type** to **Axis rotation**. The dialog then prompts you for the origin, axes, reference, and angle.



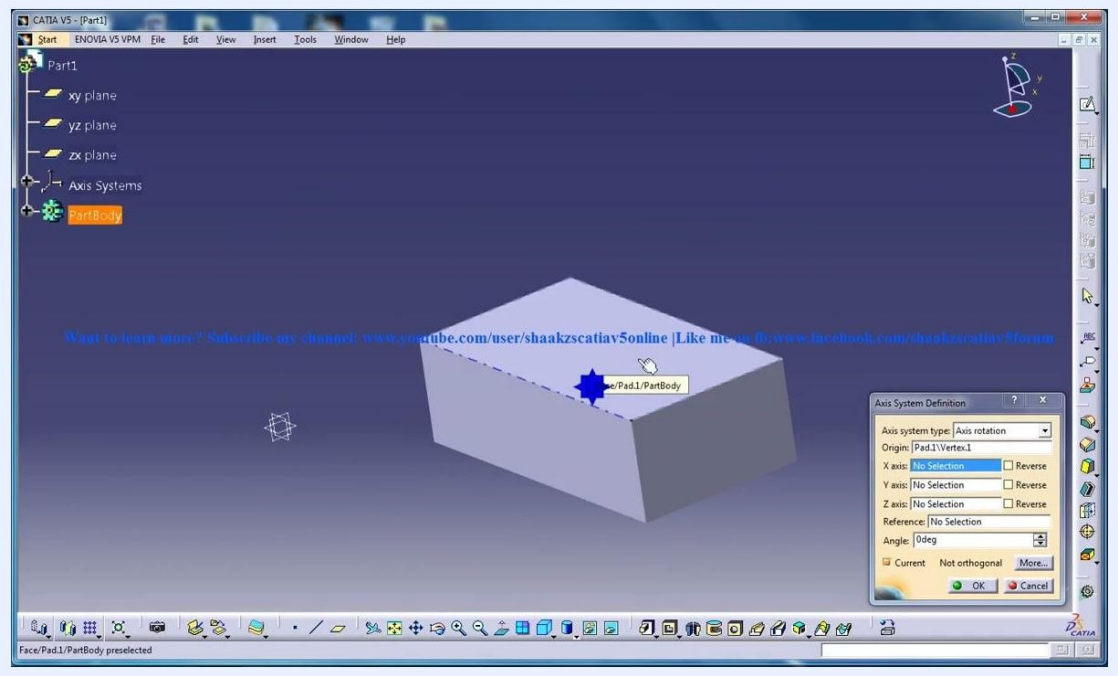
Axis System Definition dialog open and ready for input

Step 5: Specify the origin

Choose a point on your object as the origin of the new axis system.

1. Click the selection box next to **Origin**.
2. Select a vertex on your 3D object, for example Pad.1\Vertex.1.

CATIA highlights the selected vertex.



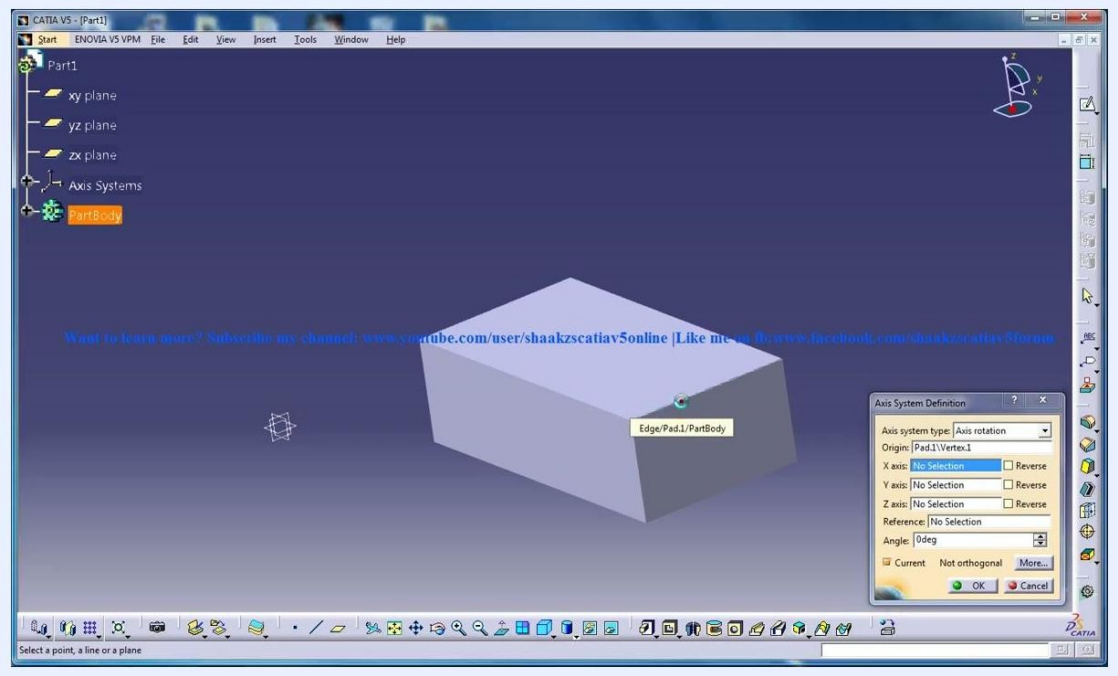
Origin set to Pad.1\Vertex.1 in the Axis System Definition dialog

Step 6: Define the X axis

Choose an edge to set the direction of the X axis.

1. Click the selection box next to **X axis**.
2. Select an edge on your object, for example Pad.1\Edge.1.

CATIA highlights the selected edge.



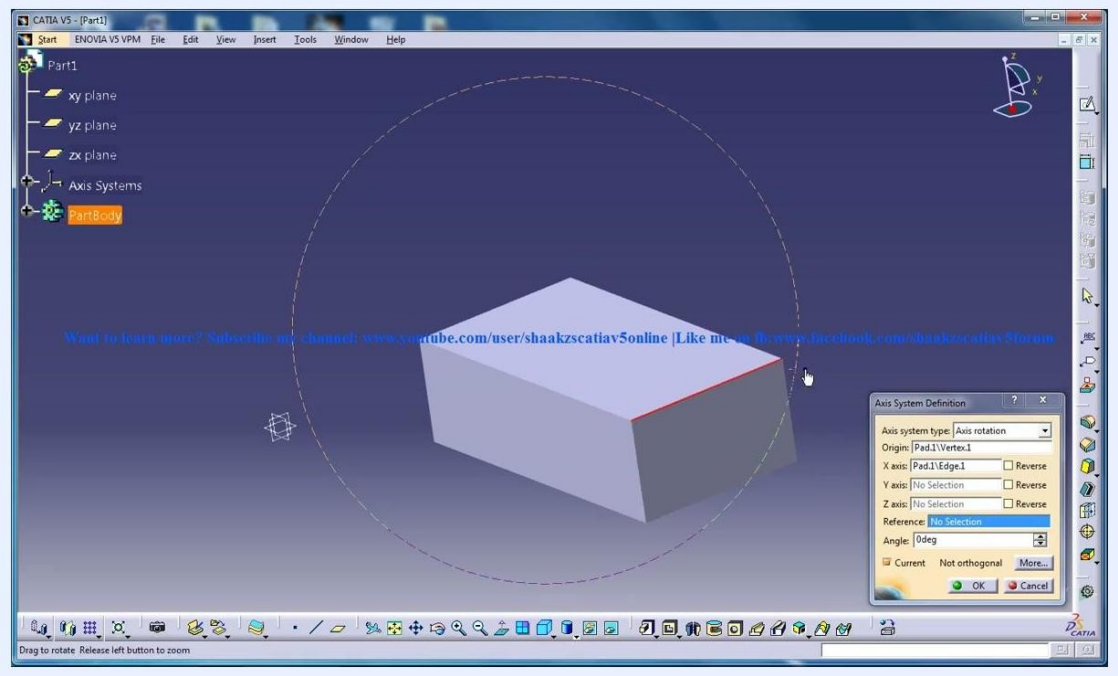
X axis set to Pad.1\Edge.1 in the Axis System Definition dialog

Step 7: Select the reference surface

Choose the surface that the axis rotation is measured against.

1. Click the selection box next to **Reference**.
2. Select a face on your object, for example Pad.1\Face.1.

CATIA uses this surface to define the rotation of the axis.



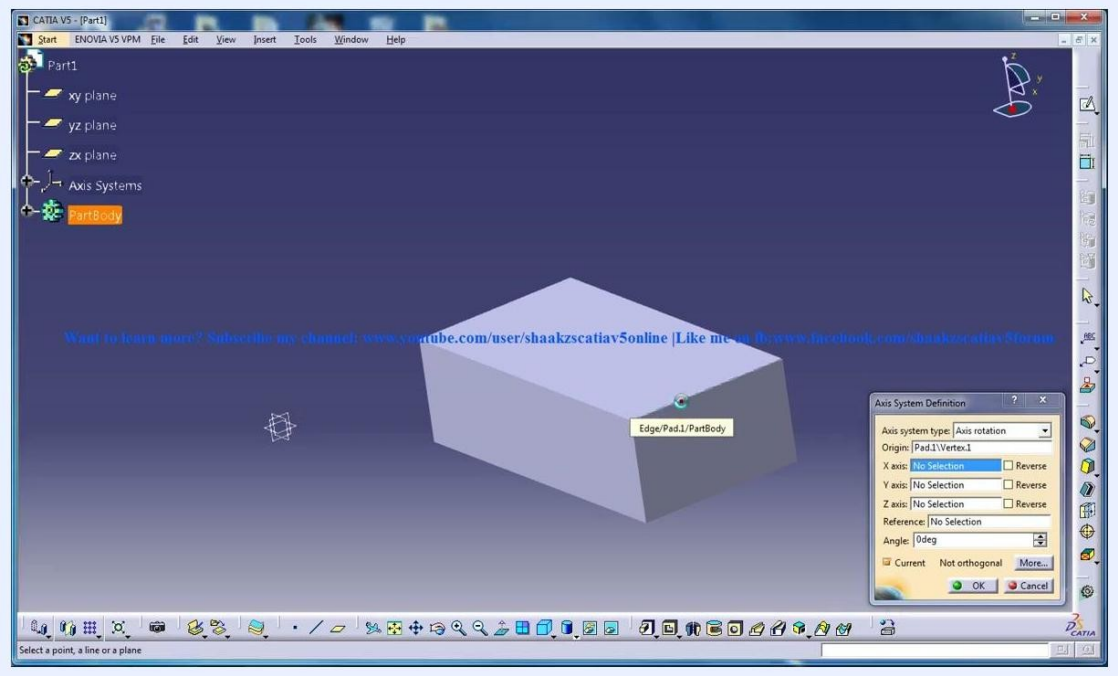
Reference surface set to Pad.1\Face.1 in the Axis System Definition dialog

Step 8: Review the axis system settings

Before you confirm, check that the Axis System Definition dialog contains these values:

- **Axis system type:** Axis rotation
- **Origin:** Pad.1\Vertex.1
- **X axis:** Pad.1\Edge.1
- **Reference:** Pad.1\Face.1
- **Angle:** 0deg, or the rotation angle you want

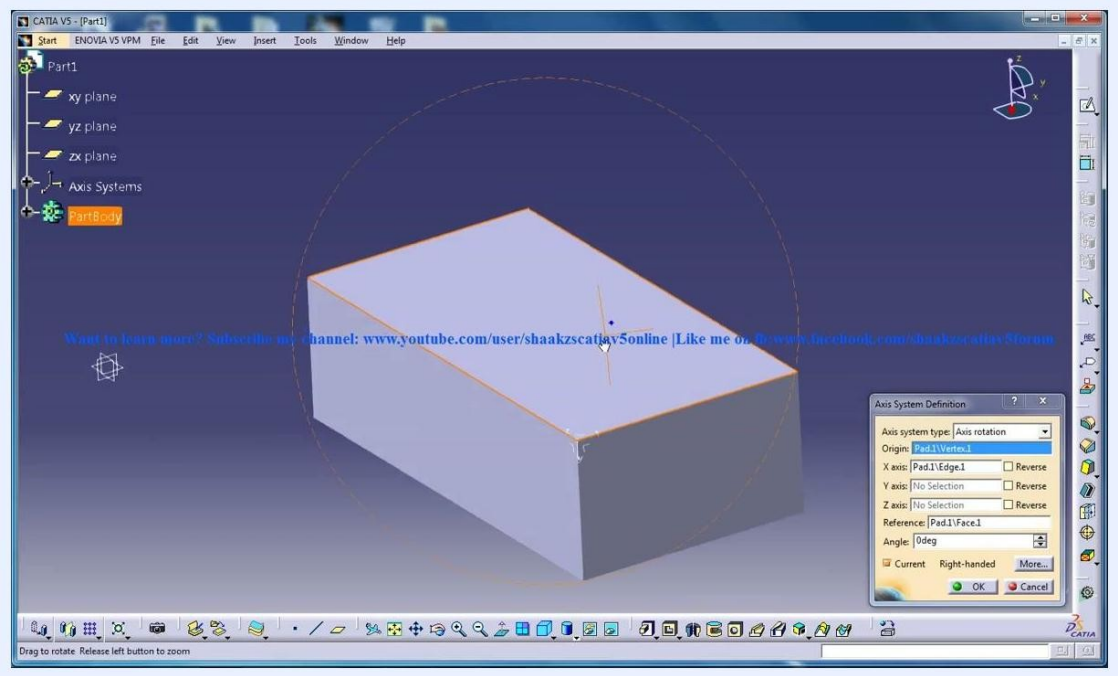
The axis system preview updates to reflect your selections.



Axis System Definition dialog filled in with origin, X axis, and reference surface, and the axis system preview shown on the object

Step 9: Confirm the axis system on the object

Check that the axis system appears correctly on your object, with the origin, X axis, and reference surface as you specified.



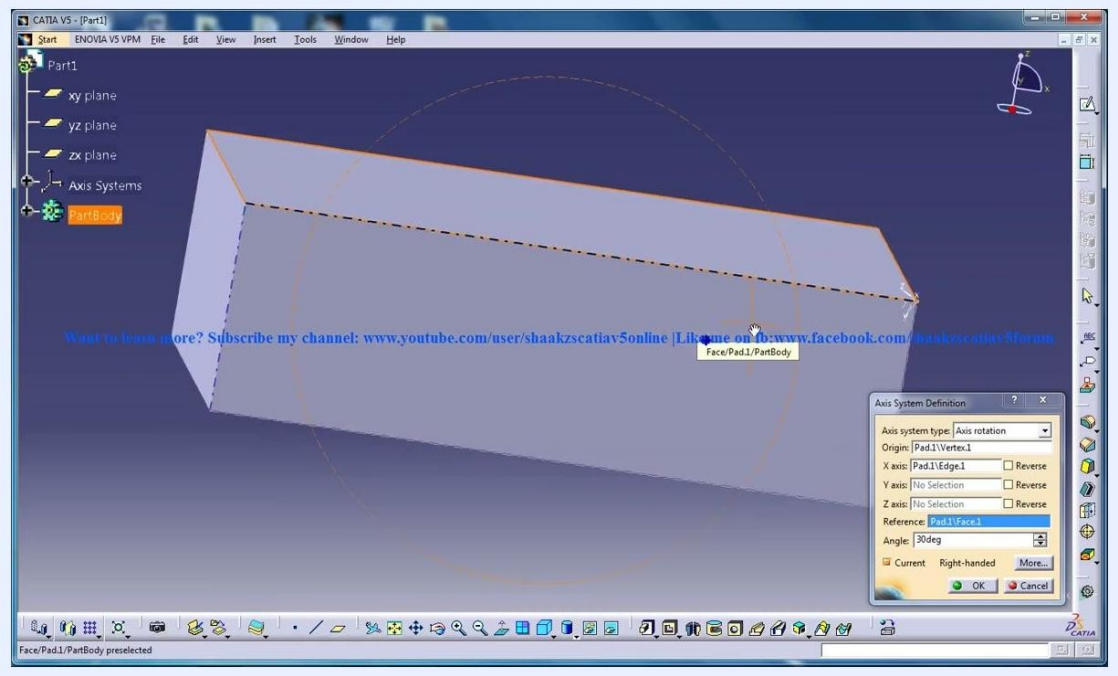
Axis system previewed on the 3D object with all selections applied

This method is especially useful when you need a custom axis that rotates at a specific angle relative to a reference surface. Always verify your selections in the dialog before you confirm.

Step 10: Check the axis rotation relative to the reference surface

The axis system rotates with respect to the reference surface you selected, for example Pad.1\Face.1. When you set an angle such as 30 degrees, the Z axis rotates by that angle relative to the reference surface.

The rotation preview appears as an orange arc or circle around the object.



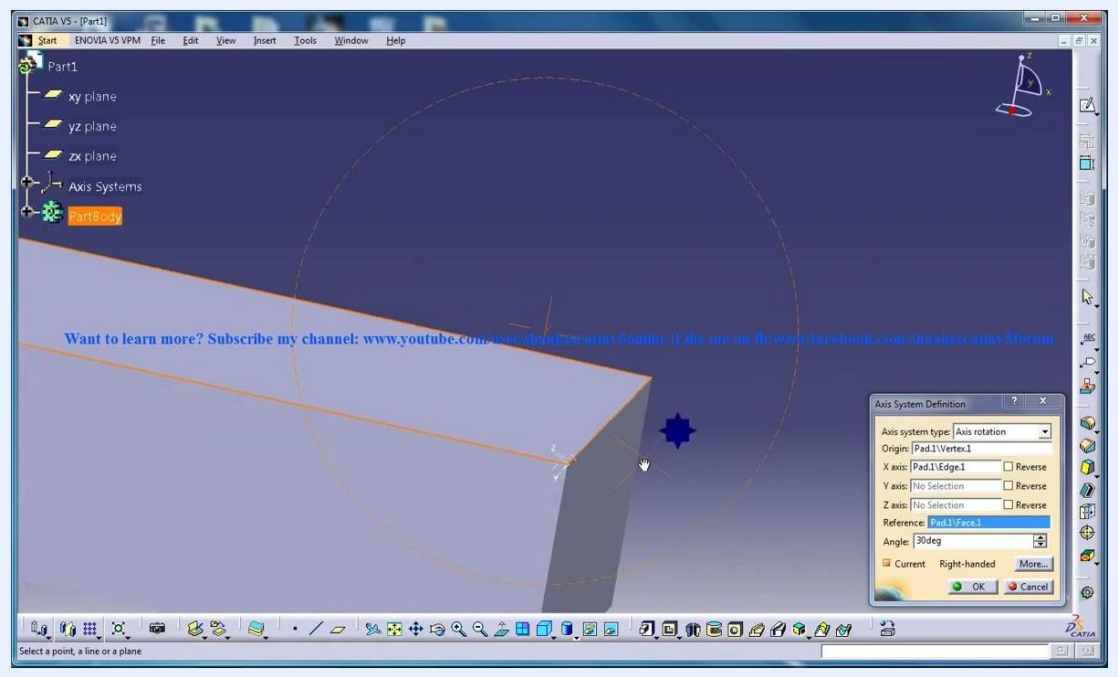
Axis system preview showing rotation relative to the reference surface, with the Axis System Definition dialog open and the angle set to 30 degrees

Step 11: Reverse axis directions to change the axis system in CATIA

You can flip the direction of each axis individually. In the Axis System Definition dialog, find the **Reverse** checkboxes next to the X, Y, and Z axis fields.

- **Z axis:** Select **Reverse** next to the Z axis to flip its direction.
- **X axis:** Select **Reverse** next to the X axis to flip its direction.
- **Y axis:** Select **Reverse** next to the Y axis to flip its direction.

When you select an option, the corresponding axis changes direction in the 3D preview. This helps you align the axis system exactly as your design or manufacturing requirements need.

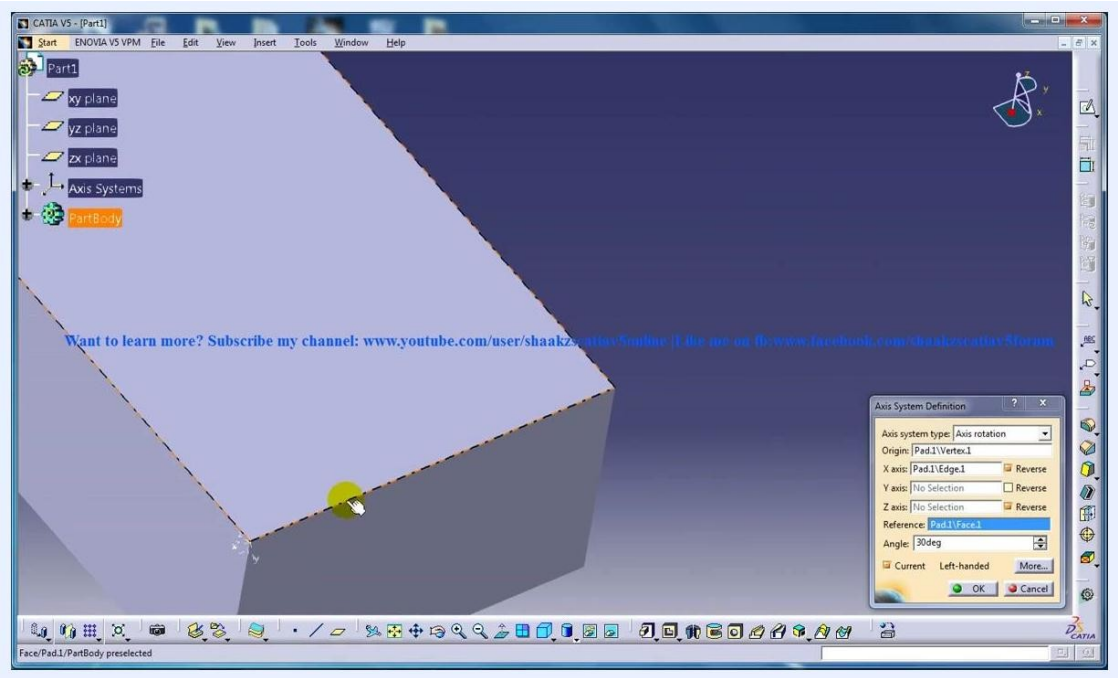


Axis System Definition dialog with Reverse options for the X, Y, and Z axes and the preview reflecting the changes

Step 12: Preview the updated orientation

After you adjust the axis directions, review the 3D preview to make sure the axis system is oriented the way you want. It should reflect any reversions or rotations you applied.

If needed, you can select different faces, edges, or vertices to refine the axis system further.

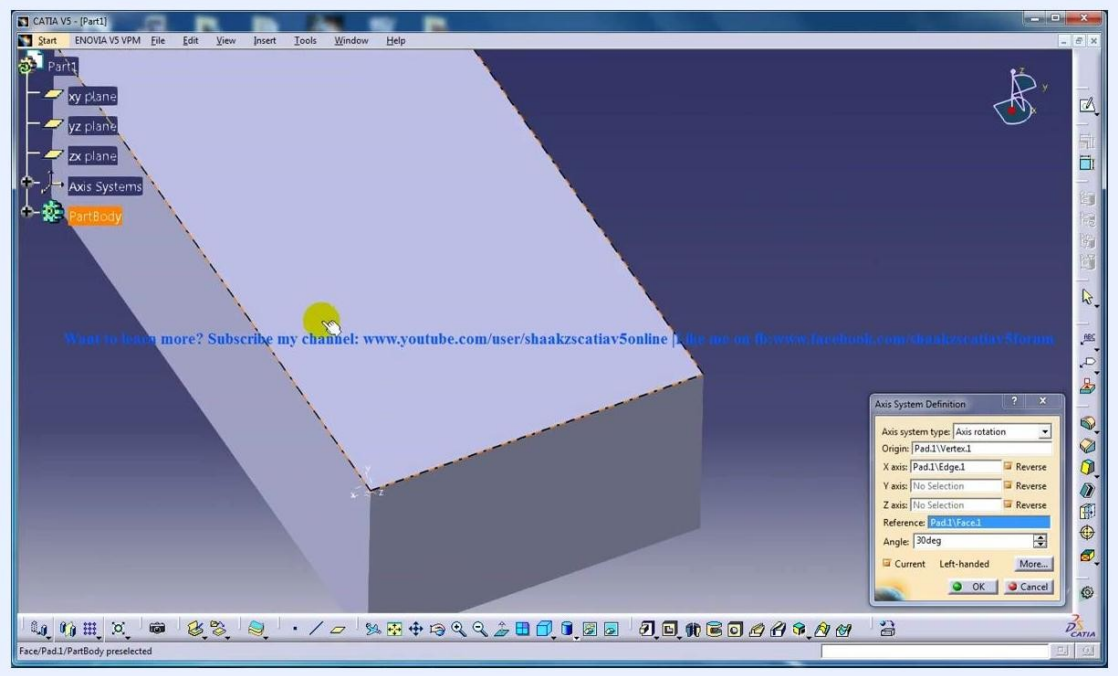


Axis system previewed on the 3D object with the updated orientation after axis reversion

Step 13: Finalize the axis system

When you are satisfied with the orientation and rotation, click **OK** in the Axis System Definition dialog to apply the changes.

CATIA adds the custom axis system to your part under the **Axis Systems** node in the specification tree.



Final axis system applied to the 3D object with the Axis System Definition dialog closed

Tips

- Use the axis reversion options when the default axis orientation does not match your design intent.
- Use the 3D preview to confirm the axis directions visually before you finalize.
- To edit the axis system later, double-click it in the specification tree.

Summary

You now know how to change the axis system in CATIA V5 using the axis rotation method. You inserted an axis system, defined its origin, X axis, and reference surface, set a rotation angle, and reversed axis directions where needed. This gives you full control over the orientation and direction of your custom axis system for precise alignment in your modeling.

What's next

- Select different vertices, edges, and faces to see how they change the axis system.

- Double-click an existing axis system in the specification tree to adjust its angle or axis directions.