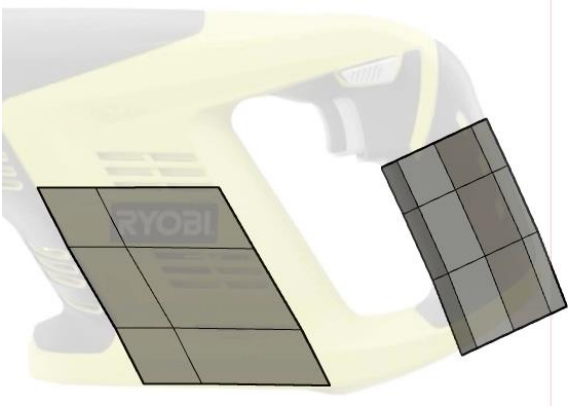
## Create and edit a form body

In this module, you'll begin to re-create a saw's casing using forms.

**Learning objectives:**

- Create a form face.
- Create a form cylinder.
- Use Edit Form.



The completed exercise

1. Upload and open the supplied *trigger with mechanics.f3d* file. This file has the canvas image and trigger from the previous modules but also has the mechanics that make the saw blade reciprocate.

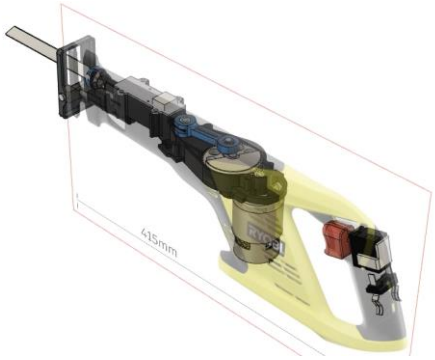


*Figure 1. Open the supplied file*

2. To begin creating the saw's casing, click Assemble> New Component.


*Figure 2. Create a new component*

**3.** Name the new component Saw Casing, check the Activate option, then OK the dialog.

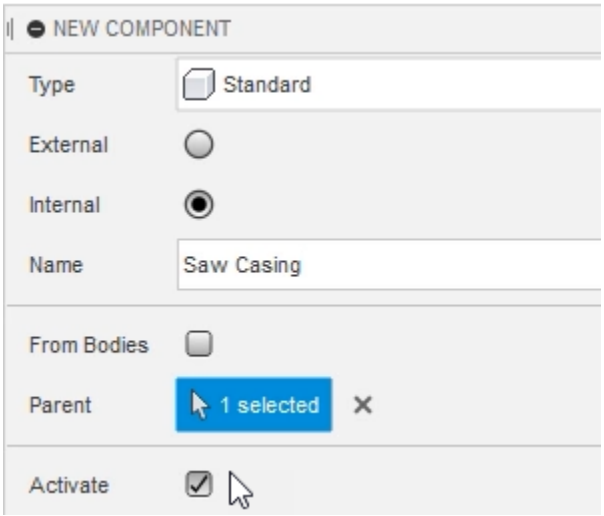



*Figure 3. Name the new component*

**4.** The saw's casing will be created using a form body; click Create> Create Form. Clicking this opens the contextual Form environment.

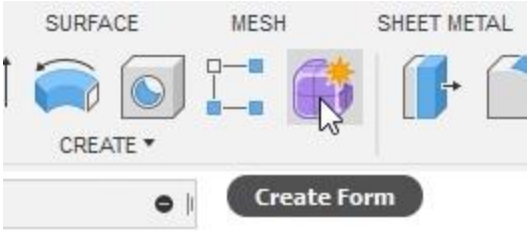



*Figure 4. Open the Create Form tool*

**5.** Right-click the saw_image canvas and choose Edit Canvas from the menu.

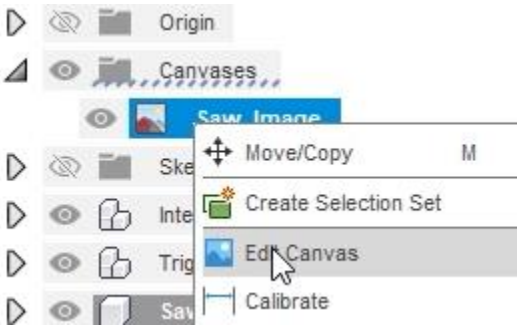



*Figure 5. Edit the saw_image canvas*

**6.** Drag the Canvas opacity slider all the way to the right, then OK the Edit Canvas dialog.

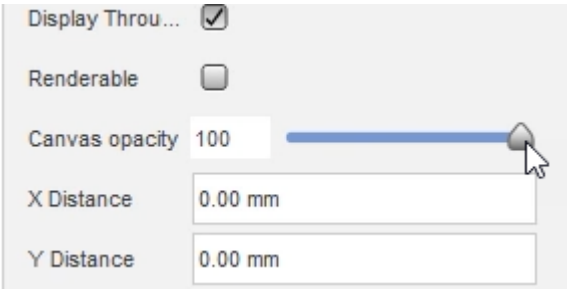



*Figure 6. Edit the canvas' s opacity*

**7.** Use the Browser to turn off the visibility for the Internal_Mechanics and Trigger Model components.

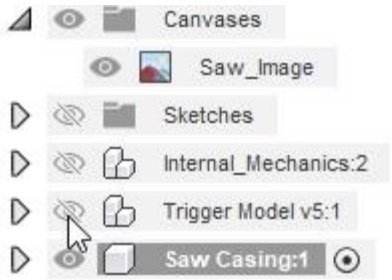



*Figure 7. Hide the unnecessary components*

**8.** Click Create> Plane.

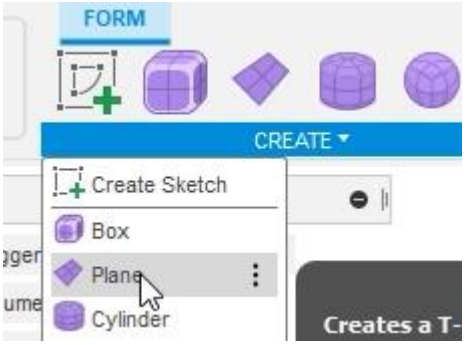



*Figure 8. Create a form plane*

**9.** Choose to sketch the new plane onto the XY plane.

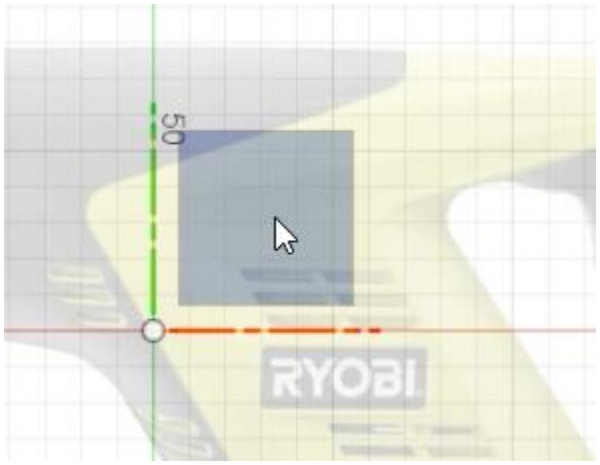



*Figure 9. Choose the XY plane*

**10.** Choose the 2-Point option from the dialog's Rectangle menu.

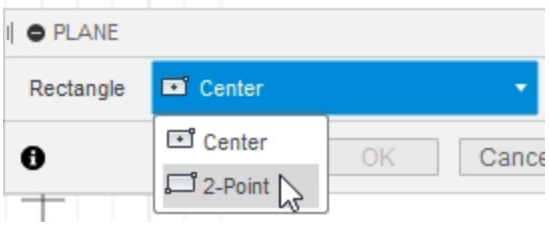



*Figure 10. Choose the rectangle type*

**11.** Draw a rectangle similar to the image on the right.

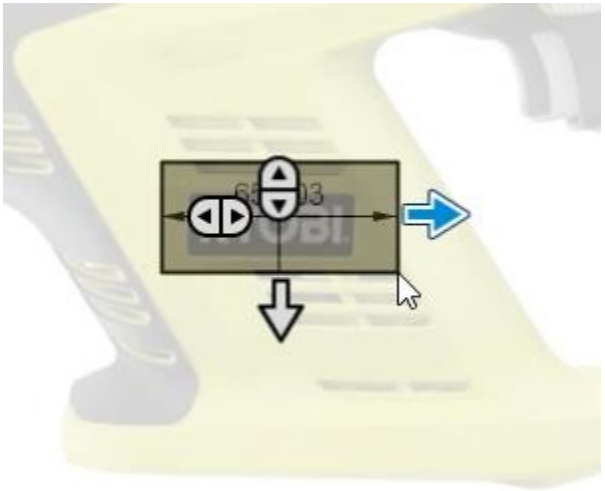


*Figure 11. Draw a rectangle*

**12.** Drag both on-screen manipulators towards the minus sign to reduce the number of faces on the new plane. OK the Plane dialog.

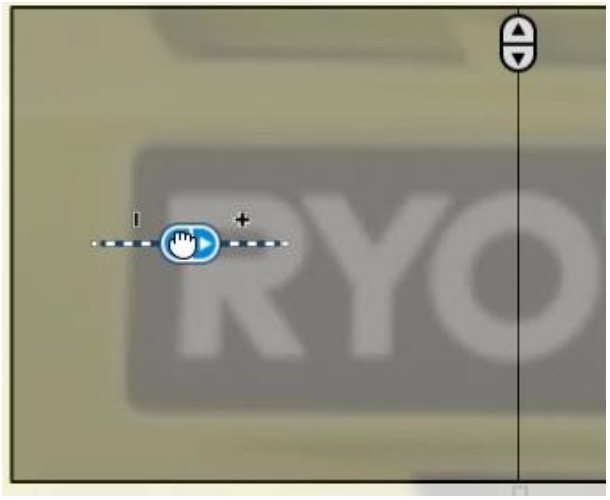


*Figure 12. Reduce the plane's faces*

**13.** Click Modify> Edit Form.

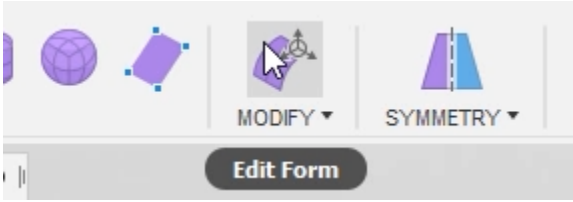



*Figure 13. Open the Edit Form tool*

**14.** Explore the many options available for selecting and modifying the form geometry. Don't make any changes to the default selections.

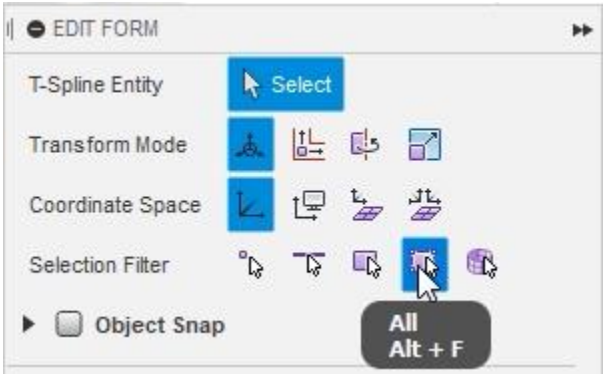



*Figure 14. Inspect the tool's many options*

**15.** Select the plane's right edge.

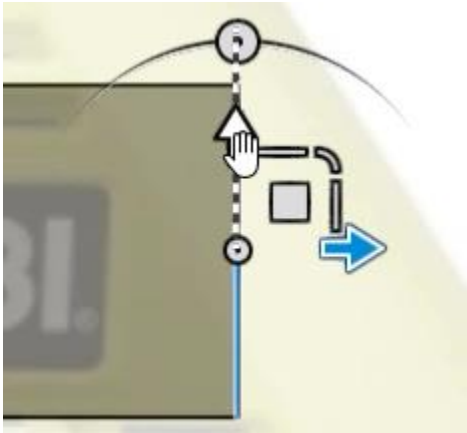


*Figure 15. Select the plane's edge*

**16.** Click Set Pivot to adjust the pivot's location.


*Figure 16. Click Set Pivot*

**17.** Choose to place the pivot at the edge's bottom corner.

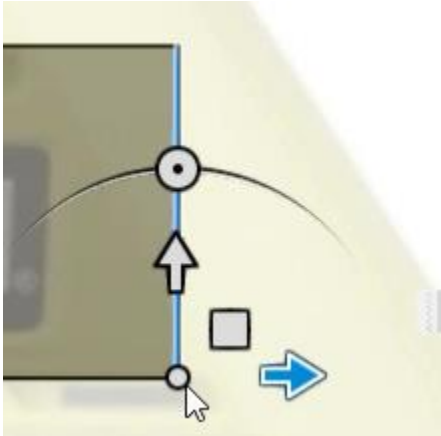


*Figure 17. Choose the pivot's new location*

**18.** Click Done to accept the pivot's new position.


*Figure 18. Accept the new position*

**19.** Rotate the plane's edge 30° using the on-screen manipulator's rotation handle.

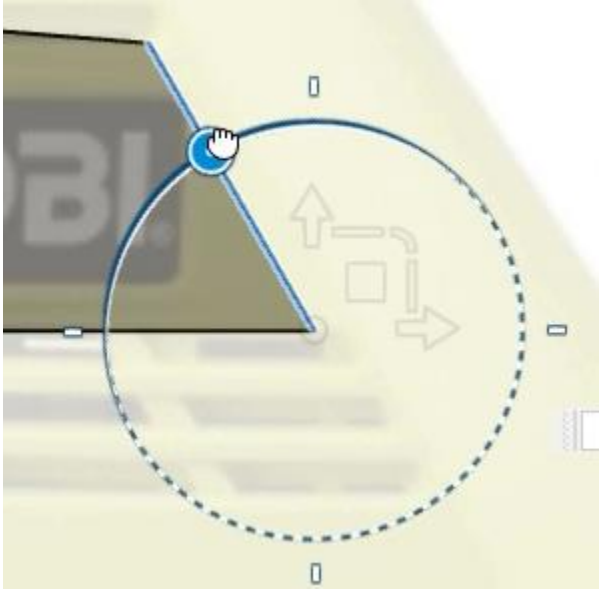


*Figure 19. Rotate the edge*

**20.** Use the on-screen manipulator's translate feature to translate the selected edge toward the casing's edge.

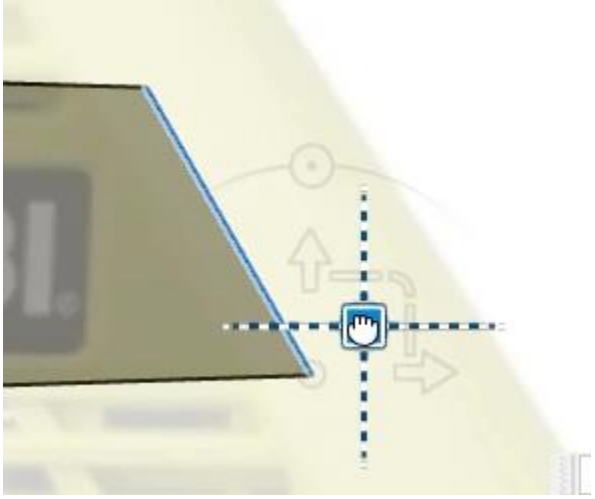


*Figure 20. Move the plane's edge*

**21.** Select one of the points on the plane's left edge and use the translate function to move the point to a new location. The plane's left edge should be roughly parallel to the right edge after you finish modifying it.

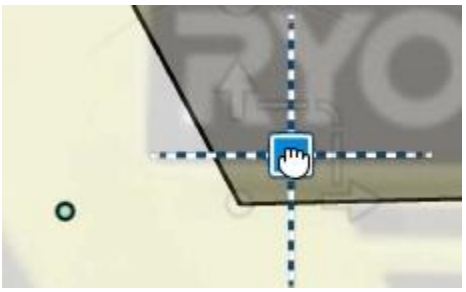


*Figure 21. Modify the plane's left edge*

**22.** Select the plane's left edge, hold Alt, and drag the edge forwards. Notice that a new face is added as you move the edge.

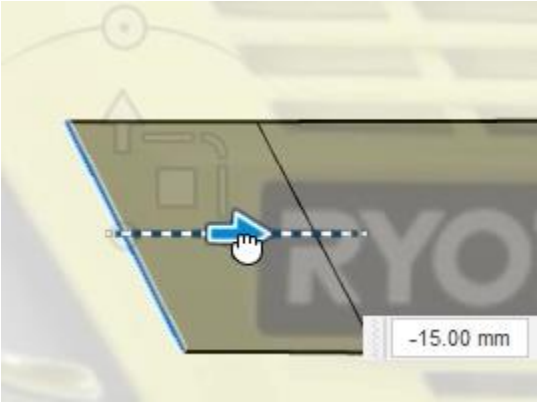



*Figure 22. Add a new face*

**23.** Select the plane's two bottom edges, hold Alt, and drag them down towards the bottom of the casing. Again, additional faces are extruded as you move the selection because you are holding the Alt key.

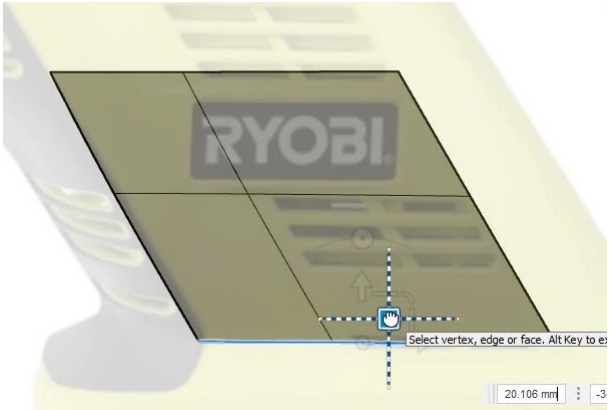



*Figure 23. Add new faces*

**24.** Hold Alt and extrude two more faces as you drag the plane down to the bottom of the saw casing.

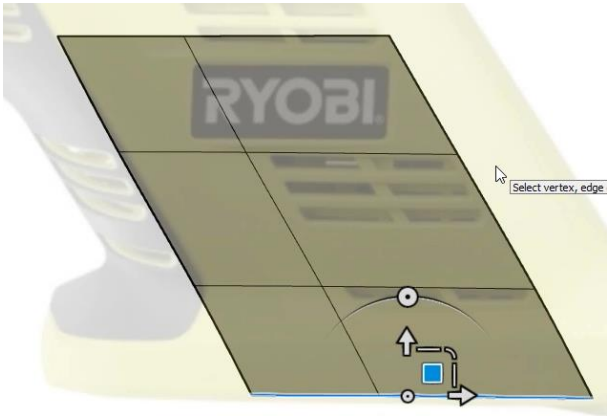



*Figure 24. Add new faces*

**25.** Select all the faces, edges, and vertices by dragging a selection box around them.

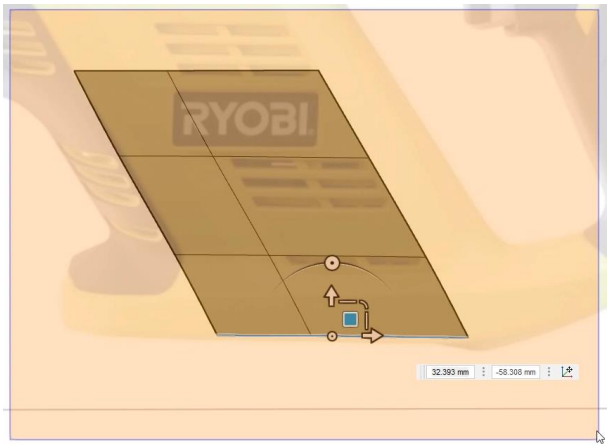



*Figure 25. Select the whole plane*

**26.** Use the View Cube to navigate to the Right view and turn on the visibility for the Internal Mechanics component.

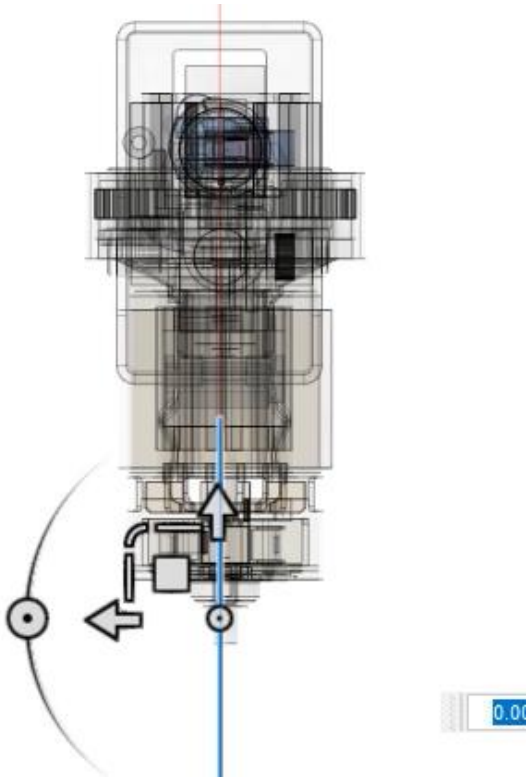


*Figure 26. Rotate the view*

**27.** Use the on-screen manipulator to drag the plane 35 mm so it rests outside the saw's mechanics. OK the Edit Form dialog.

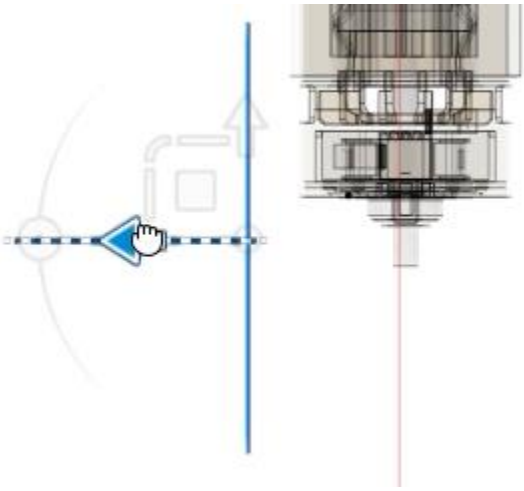


*Figure 27. Move the plane*

**28.** Click Create> Cylinder.

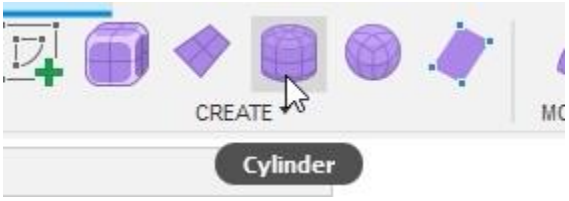



*Figure 28. Open the Cylinder tool*

**29.** Choose to sketch the cylinder on the XZ plane.

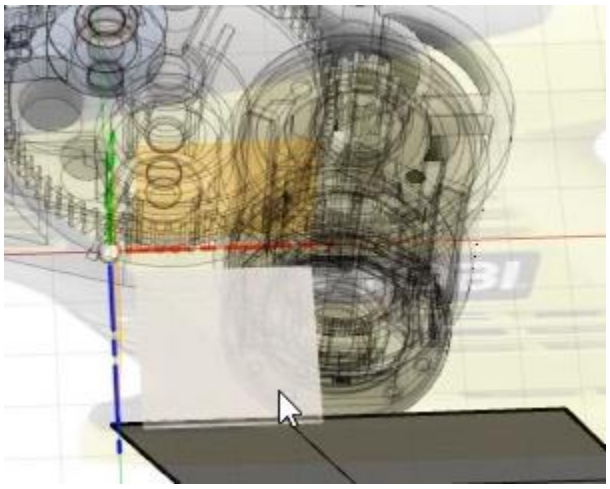


*Figure 29. Choose the XZ plane*

**30.** Use the Browser to hide the Internal_Mechanics component and draw a circle with a 22 mm radius.

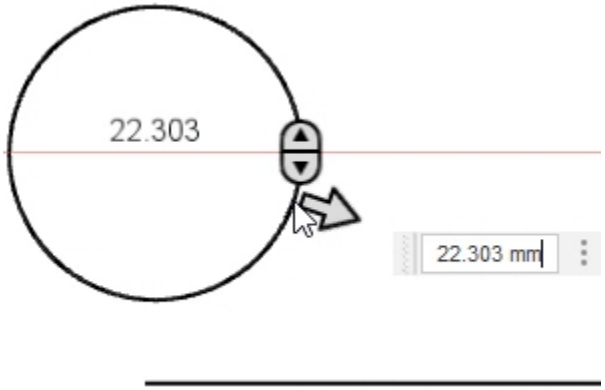



*Figure 30. Draw a circle*

**31.** OK the dialog to create the cylinder. Note that you cannot reopen the Cylinder tool to adjust its parameters; double-click the edge loop shown in the image on the right to select the entire loop.

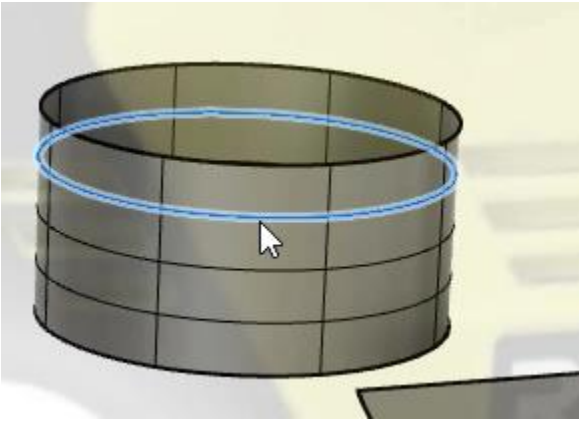


*Figure 31. Create the cylinder*

**32.** Press Delete to remove the edge loop. Repeat this process to remove the other two edge loops so that the cylinder is only one face tall.

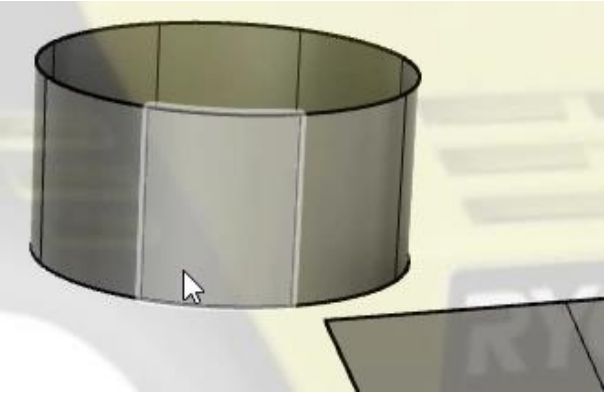


*Figure 32. Reduce the number of faces*

**33.** Click Utilities> Display Mode.

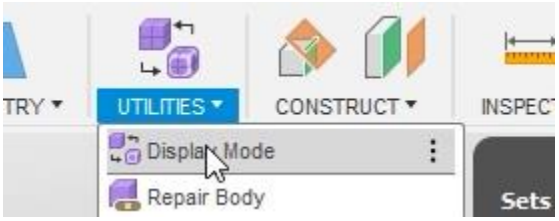



*Figure 33. Open the Display Mode dialog*

**34.** For the dialog's T-Spline Entity selection, choose the cylinder you just created. Activate the Box Display option in the Display Mode section.


*Figure 34. Activate the Box Display mode*

**35.** Notice that the cylinder's roundness is removed and it now looks octagonal.

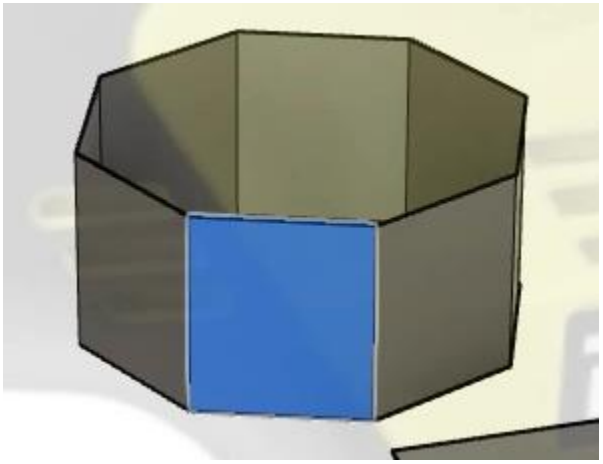


*Figure 35. Inspect the result*

**36.** Choose the Smooth Display option to return the cylinder to its original shape. Toggling between Box Display and Smooth Display is a very important tool when analyzing a form's geometry. Using the Alt+1 and Alt+3 keyboard shortcuts is an efficient way to toggle between these two display modes.

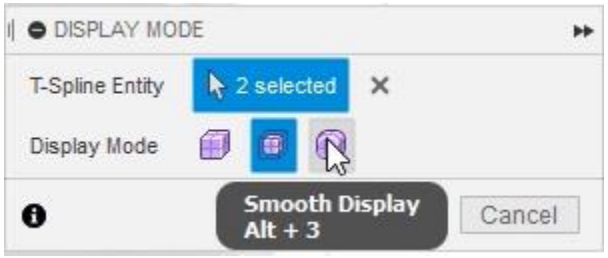



*Figure 36. Activate the Smooth Display mode*

**37.** Open the Edit Form tool again by clicking Modify> Edit Form, then choose the Body option in the Selection Filter section.

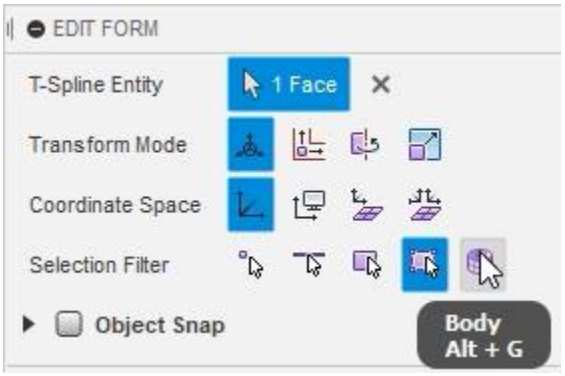



*Figure 37. Activate the Body filter*

**38.** Select the cylinder and use the on-screen manipulator to translate and rotate the cylinder so it matches the casing's handle.

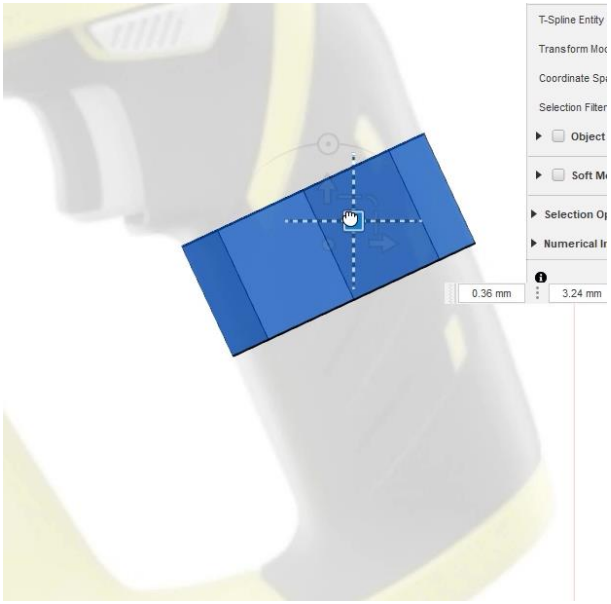



*Figure 38. Move the cylinder*

**39.** Activate the All option in the dialog's Selection Filter section.

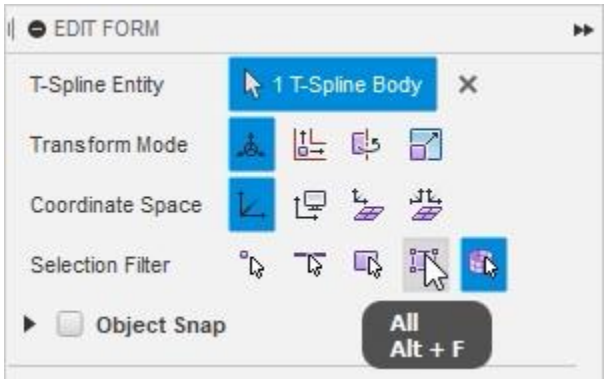



*Figure 39. Choose the All filter*

**40.** View the cylinder from the Top view and select the top four faces. Press Delete to remove these extra faces.

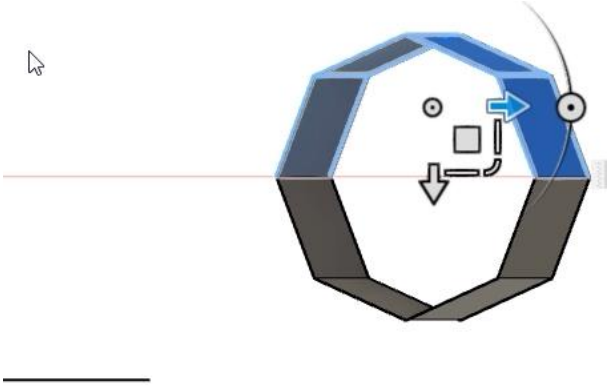


*Figure 40. Select four faces*

**41.** Select the cylinder's four bottom edges, hold Alt, then use the on-screen manipulator to extrude for new faces downwards along the casing's handle.

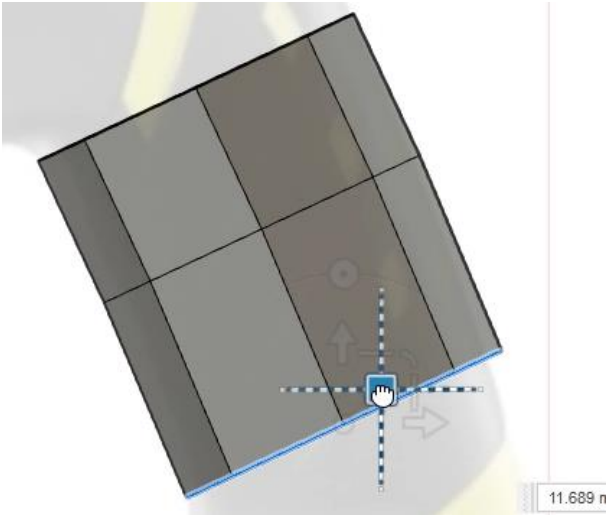



*Figure 41. Extrude new faces*

**42.** Hold Alt and extrude a third row of faces downwards towards the bottom of the saw's casing. OK the dialog to accept the changes and save the file. If you save a file while you are in the Forms environment, the file will reopen in the Forms environment. Continue to the next module.

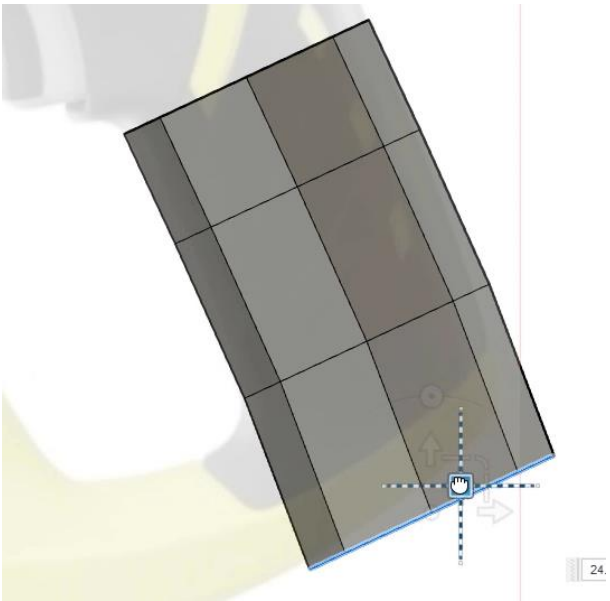


*Figure 42. Extrude new faces*