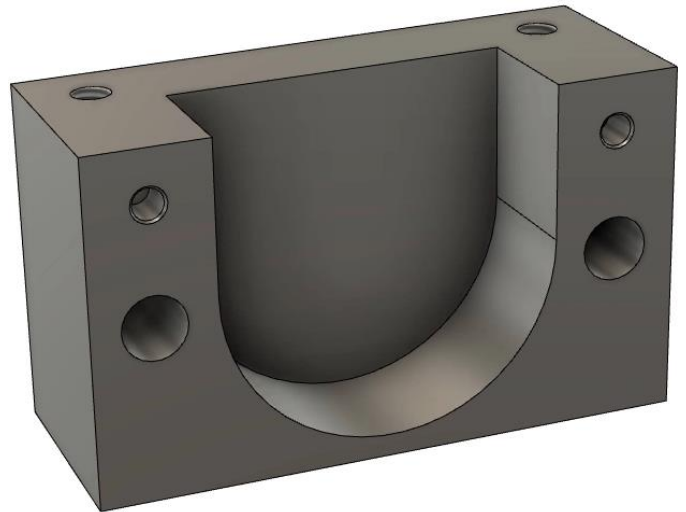


Apply direct modeling tools

In this module, you'll explore a few direct modeling tools that allow you to efficiently adjust geometry on a model that does not have timeline history.

Learning objectives:

- Understand the use-case for direct modeling tools.
- Apply direct modeling tools to remove or move features.



The completed exercise

1. Open the supplied *Engine Case RH - No Timeline.f3d* file. This file's geometry is identical to the file you completed in the previous module. However, this file was imported from a different CAD system and converted to a Fusion 360 file type. This means that there is no timeline history associated with the model.

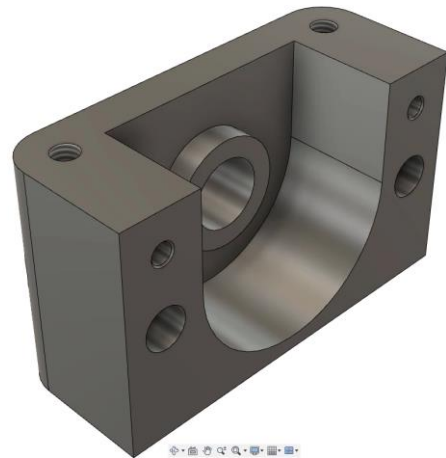


Figure 1. Open the supplied file

2. Direct modeling tools can be used to modify the model's geometry. Click Modify> Press Pull.

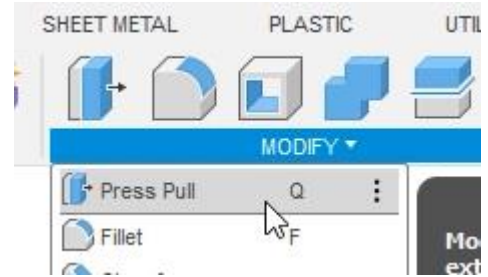


Figure 2. Open the Press Pull tool

3. Select one of the corner fillets and notice that the Offset Face dialog opens. Use the on-screen manipulator to adjust the fillet's radius. Notice that both the fillet's radius and the intersection of the fillet and the counterbore are automatically updated.

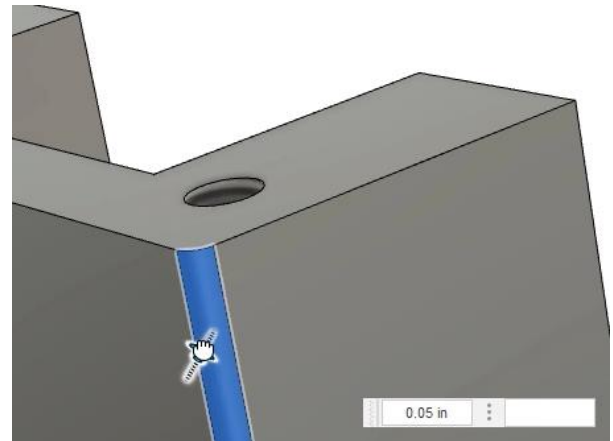


Figure 3. Adjust the fillets

4. Clear the current selection by clicking the X next to the Faces selection.

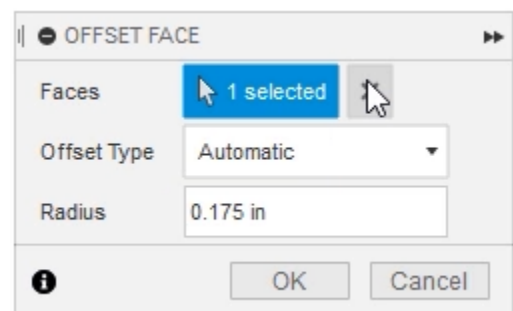


Figure 4. Clear the current selection

5. Select the face shown in the image on the right and use the on-screen manipulator to drag it forwards to remove the counterbore boss.



Figure 5. Modify the selected face's position

6. Select the counterbore's face and notice the blue face moves up to match the selected face. OK the dialog.



Figure 6. Select the distance to move the face

7. Inspect the result and notice that the counterbore feature has been completely removed.

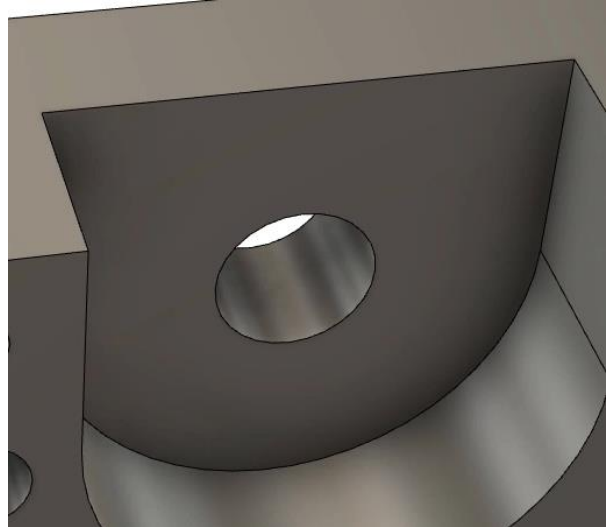


Figure 7. Inspect the result

8. Open the Move/Copy tool.

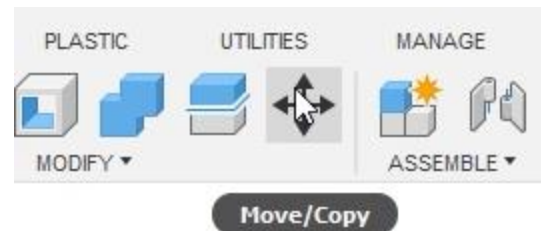


Figure 8. Open the Move/Copy tool

9. Choose the Faces option from the dialog's Move Object menu.

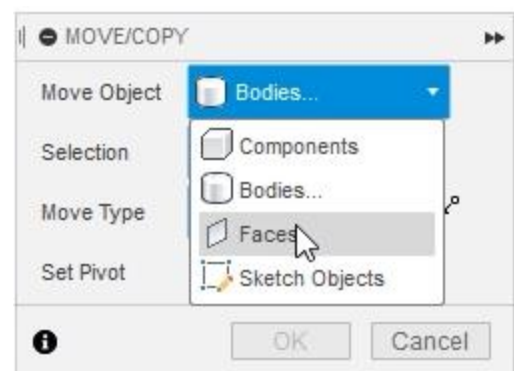


Figure 9. Choose the type of object that needs to be moved

- 10.** Choose the cylindrical face inside two of the body's holes. If the hole also has a chamfer or a counterbore, also select these faces. Notice that the selection's pivot point has arrows that are not perfectly aligned with the WCS.

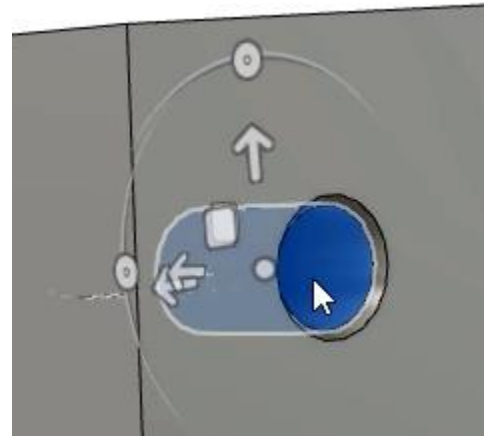


Figure 10. Choose the faces to move

- 11.** Activate the dialog's Set Pivot option.

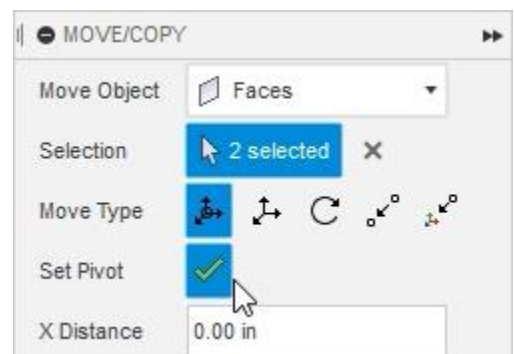


Figure 11. Activate the Set Pivot option

- 12.** Select the body's top edge so that the pivot is aligned with the WCS, then OK the dialog's Set Pivot selection.

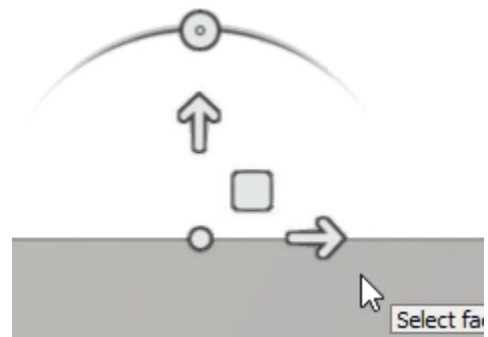


Figure 12. Select the new pivot orientation

- 13.** Choose the arrow pointing the direction you want to move the holes, then drag the on-screen manipulator's arrow in that direction. OK the dialog after you finish moving the holes.

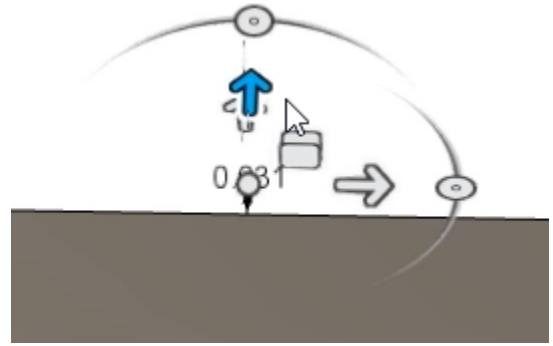


Figure 13. Choose the direction to move the selection

- 14.** Select the face shown in the image on right.

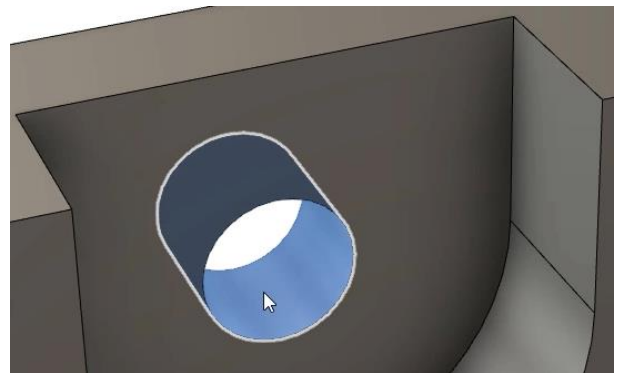


Figure 14. Select a face

- 15.** Click Modify > Delete.

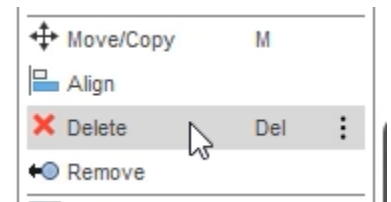


Figure 15. Delete the selected face

- 16.** Inspect the result and notice that the selected face is deleted and the body's geometry is automatically patched.

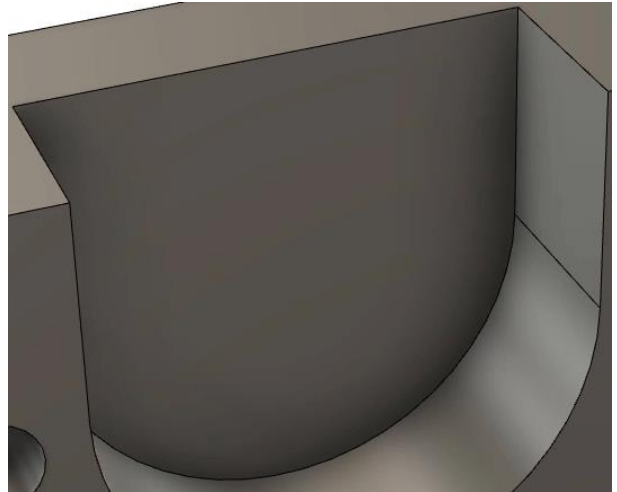


Figure 16. Inspect the result

- 17.** Select the body's fillets and press the keyboard's Delete. Notice that the fillet is removed and the edges are returned to the body.



Figure 17. Delete the fillets

- 18.** Select two faces describing a counterbore and press Delete. Notice that the counterbore is removed but the hole is not affected.

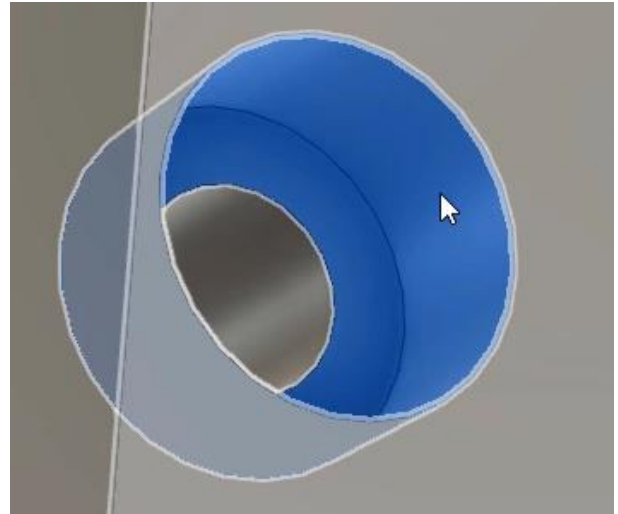


Figure 18. Delete a counterbore

- 19.** Even though the file did not originally have a timeline, all the features you created in this module are added to the timeline.

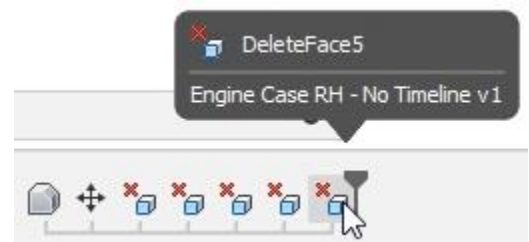


Figure 19. Inspect the timeline

- 20.** The timeline marker can be dragged backwards to temporarily return the model to its original state. If you choose to save your work, save the file using a different name. The supplied data set will be used for future modules in this course. Continue to the next module.



Figure 20. Move the timeline marker