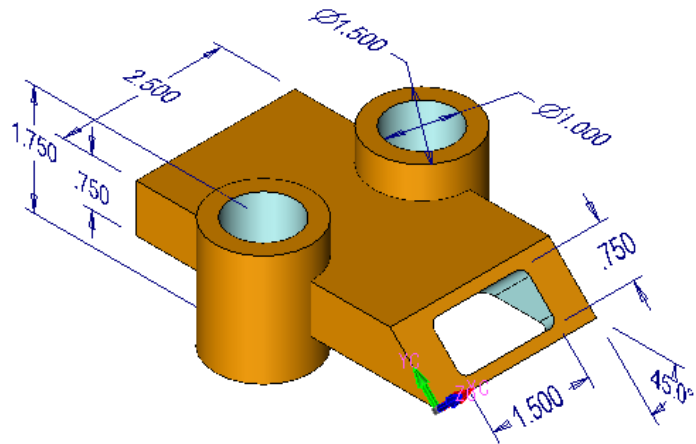


## KeyCreator Lesson KC1022

### Basic Part Modification Using Dimension Driven Editing

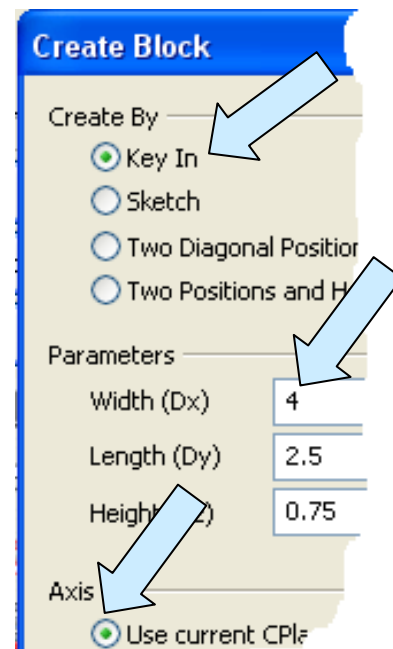
In this lesson we are going to quickly create the basic part illustrated to the right. We'll then use the powerful new Dimension Driven Editing Tool to quickly modify the part in several ways.



We'll start with a new file in View 1. (The Top View.)

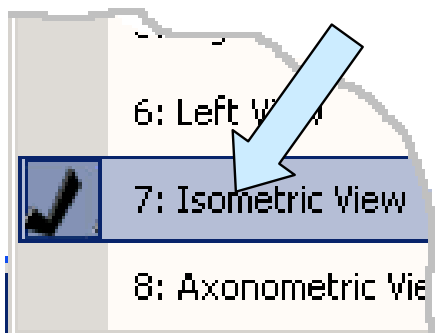
Click on the PRIMITIVE BLOCK Icon.

A Dialog Box appears.

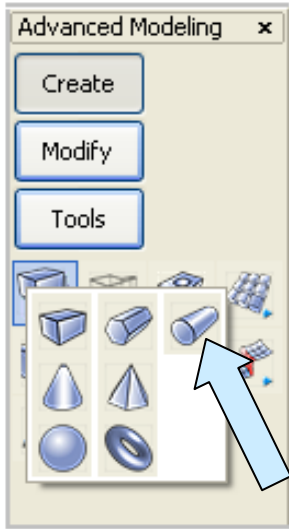


Use the Key In Option and type 4 for the Width, 2.5 for the Length, and 0.75 for the Height. Use the Current Cplane Option and hit the ENTER Key.

Using the Cursor Option, click anywhere on the screen to place the block.

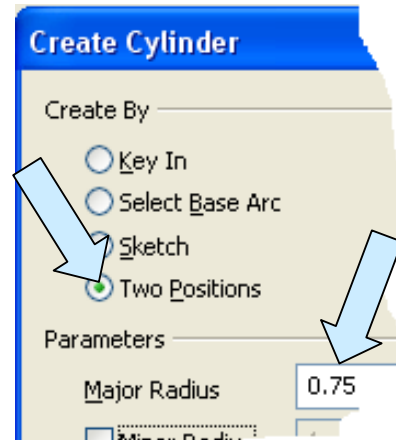


Now, switch to the Isometric View (View 7.) and Autoscale the display.

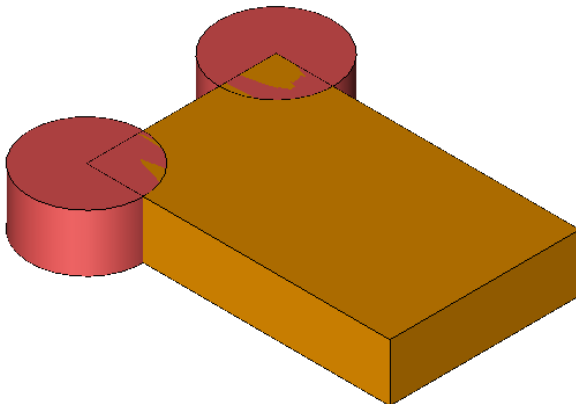


Now, click on the PRIMITIVE CYLINDER Icon.

A Dialog Box appears.



Click on the Two Positions Option and type 0.75 for the Major Radius. Hit the ENTER Key.

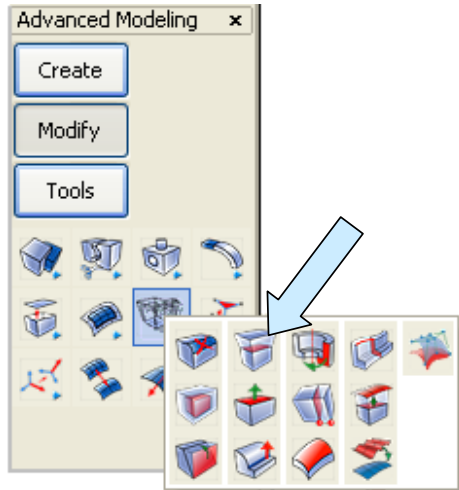


Using the EndEnt Option, click on the top end and bottom end of the left, front corner on the part.

Repeat, clicking on the top and bottom ends of the left, rear corner.

Your screen should now look like this:  
(I've used a different color for the cylinders so that they stand out in the illustration.)

Using the primitive block and cylinder tools is an easy way to quickly create the basic shapes that make up this part, we'll see in a moment how we can modify these starting objects to get our final object.



Now, click on the EXTRUDE OUTWARD FACE Icon.

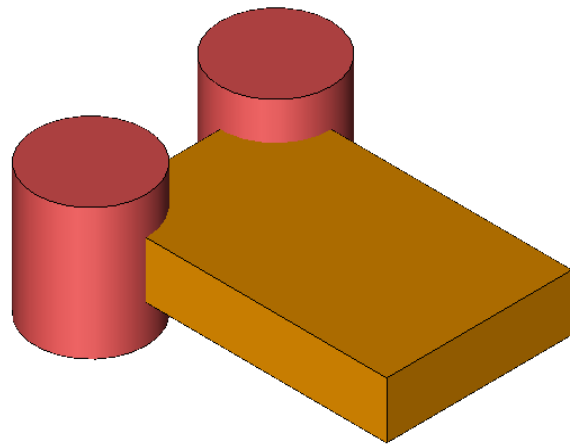
A Dialog Box appears. Type 0.5 for the Length and hit the ENTER Key.

Move the cursor over the top face of the front cylinder and click on it when it highlights. Notice that the cylinder grows upward an additional 0.5 inches. Repeat this with the rear cylinder.

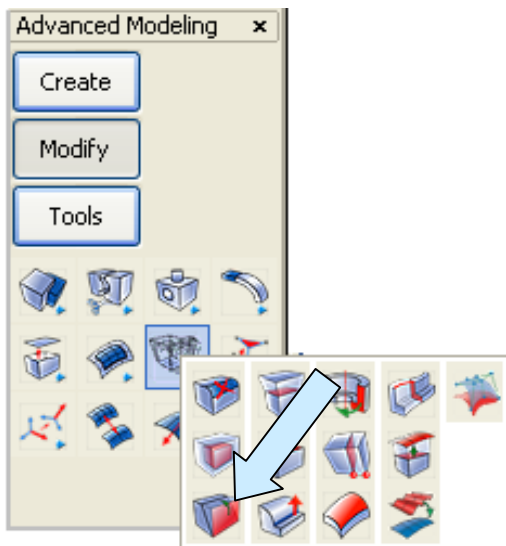
Now extend the bottoms of the cylinders downward 0.5 inches using the same process.

To select the hidden faces, move the cursor over the hidden face and touch the SPACEBAR or TAB Key once to index the Face Selector to the hidden face. Click while the face is highlighted.

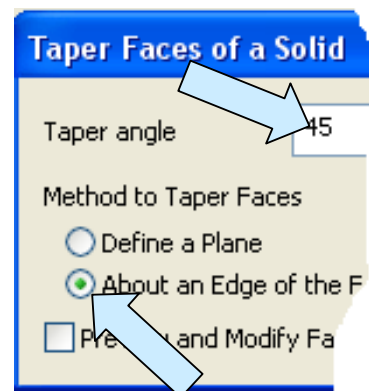
When you are finished, your screen should look like this:



Our next task is to create the 45 degree sloped face on the right end of the part.



To do this, click on the TAPER FACES Icon.



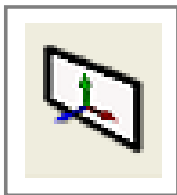
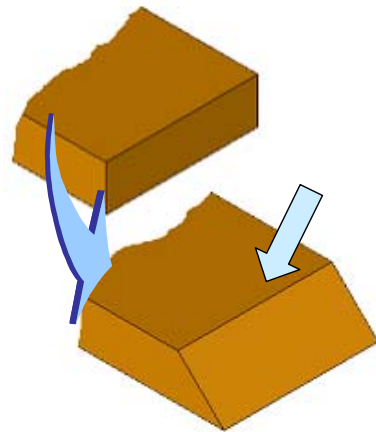
A small Dialog Box appears. Type 45 for the Taper Angle and select About an Edge of a Face. Hit the ENTER Key.

Move the cursor over the right, vertical face of the part and click on it when it highlights.

Now, click on the top, right edge of the part and hit the ENTER Key.

Select the Two Pts Option on the Conversation Bar and using the EndEnt Option, click on the bottom end and then on the top end of the right, front corner of the part.

The part now rebuilds with a 45 degree slope on the right end.



Now, click on the CONSTRUCTION PLANE Icon.

Click on the bottom edge of the sloped, right face and then on the front edge of the sloped, right face.

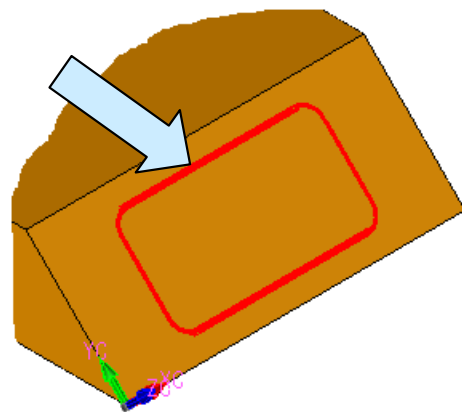
Now, select a different construction color.



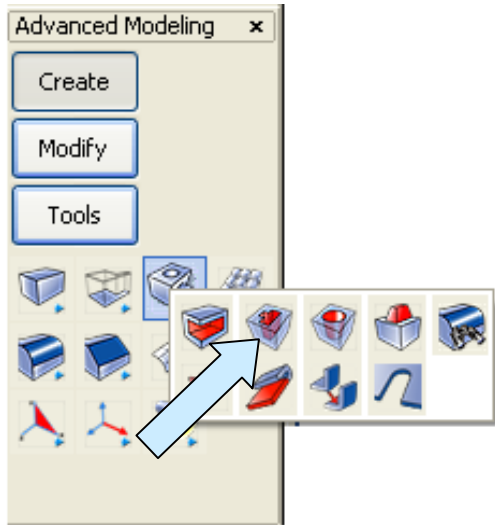
Click on the ROUNDED RECTANGLE BY WIDTH HEIGHT Icon. Type 0.125 for the corner radius and hit the ENTER Key.

Click on the MidCtr Anchoring Option on the Conversation Bar. Type 1.5 for the Width and 0.75 for The Height.

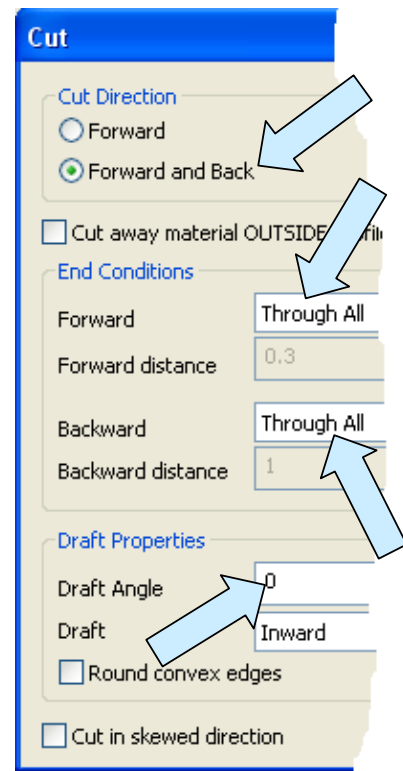
Click on the Two Pos Option. Then, using the CtrMid Option, click on the front, right oblique edge and the rear, right oblique edge.



This positions the rounded rectangle in the exact center of the sloped face on the part.



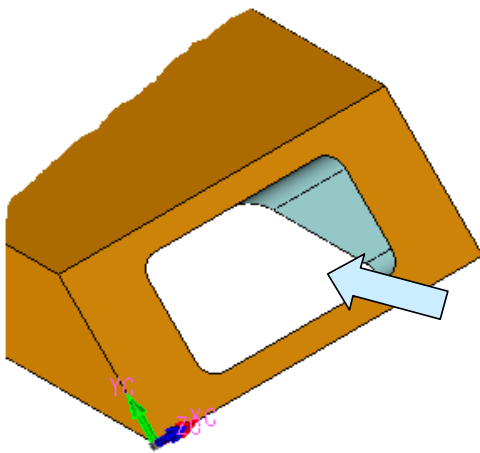
Click on the CUT Icon.



A Dialog Box appears. Use the Forward and Back Option. Select the Through All Option for both End Conditions.

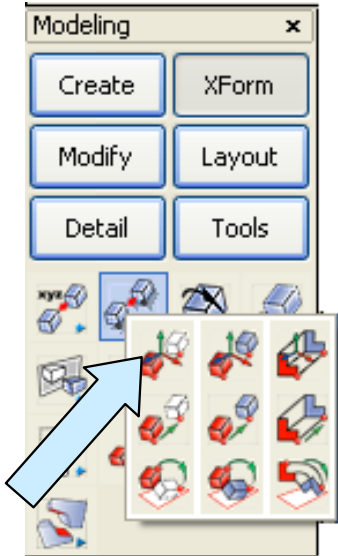
Use a 0 draft angle and hit the ENTER Key.

Select the solid block and then select the rounded rectangle that you created by using the ALL DSP, BY TYPE Option and picking the unique color that you used for the profile.



You will now have an opening in the right end of the part.

Our next task is to combine the two cylinders that we created earlier with the block to make one solid part. Now you might be jumping up and down at this point trying to point out that in the initial illustration of the part the cylindrical bosses are positioned at the midpoints of the front and back edges. In our current construction they are located at the left corners on the part. What gives?

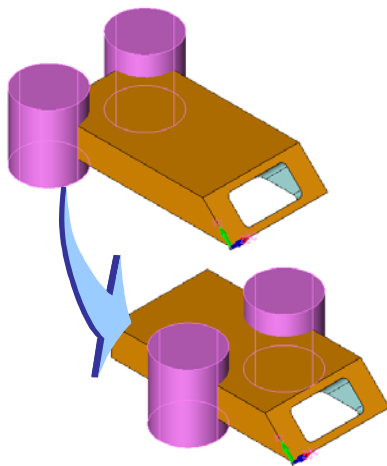


I did this on purpose since this is a teaching exercise and my goal is to give you as much flexibility as possible. I purposely had you locate the cylinders at the wrong spot and I didn't immediately union the cylinders to the block because it is easier to adjust positions of features when they are independent solid objects. Since there are no restrictions on how many independent solids you can have in a single file, you can conceptualize parts by simply positioning pieces on the screen and then combining them into one solid at a later date.

Let's quickly reposition the two cylinders by clicking on the XFORM OLD-NEW MOVE Icon.

Click on the two cylinders and hit the ENTER Key.

Now, using the EndEnt Option, click on the front, top, left corner of the main block. (It is buried inside the front cylinder so you might find it easier to work in Wireframe display mode at this point.)



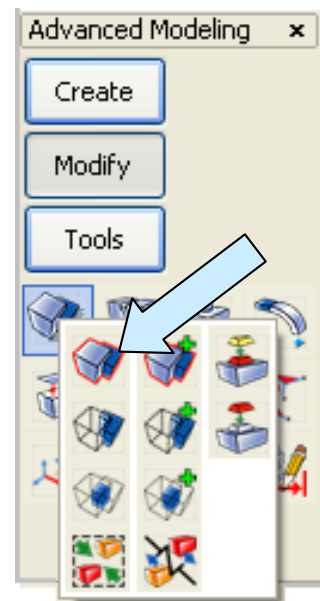
Hit the ENTER Key and then, using the CtrMid Option, click on the top, front edge of the block.

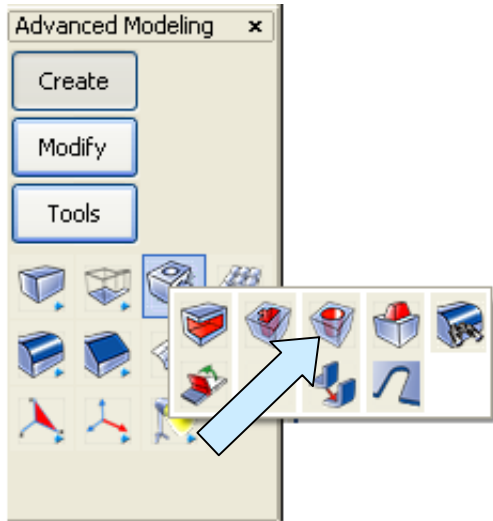
Both cylinders move to the correct position.

Now, click on the BOOLEAN UNION Icon.

Select the block and the two cylinders and hit the ENTER Key.

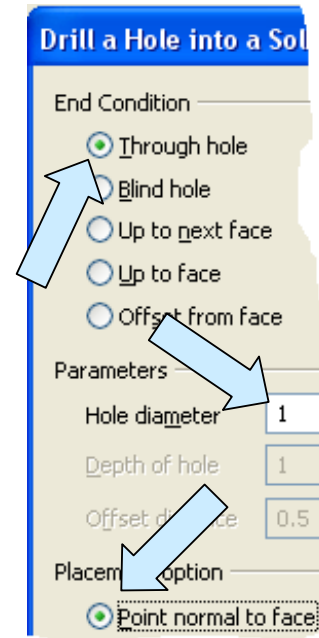
You now have one solid object on the screen.





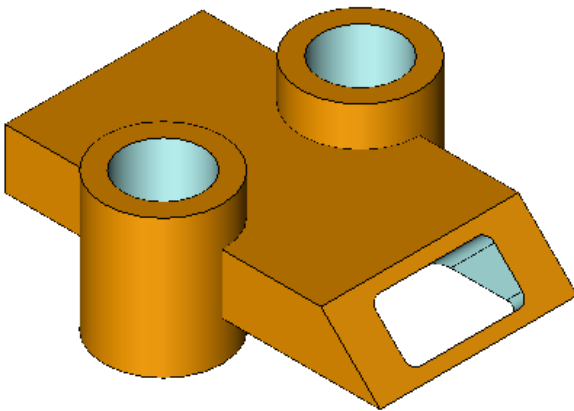
Now, click on the DRILL Icon.

A Dialog Box appears.



Use the Through Hole Option and type 1 for the diameter. Select the Point Normal to Face Option and hit the ENTER Key.

Click on the top face of the front cylinder and using the CtrlMid Option click on the top circular edge of the cylinder. This creates a hole in the front cylindrical boss.

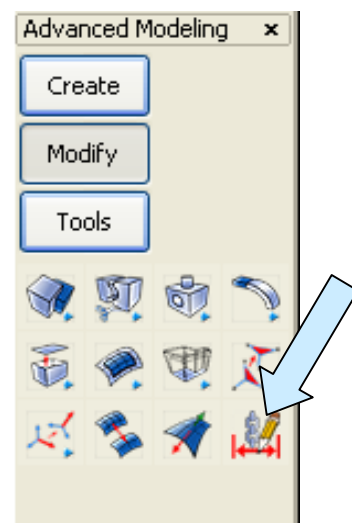


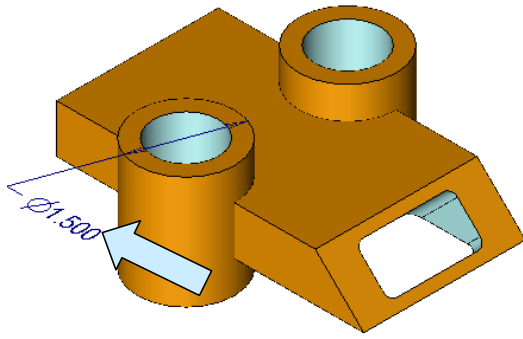
Repeat this process to create a hole in the rear cylindrical boss.

Your part is now finished.

Now, let's make some modifications to our part using the Dimension Driven Editing Function.

Click on the DIMENSION DRIVEN EDITING Icon.



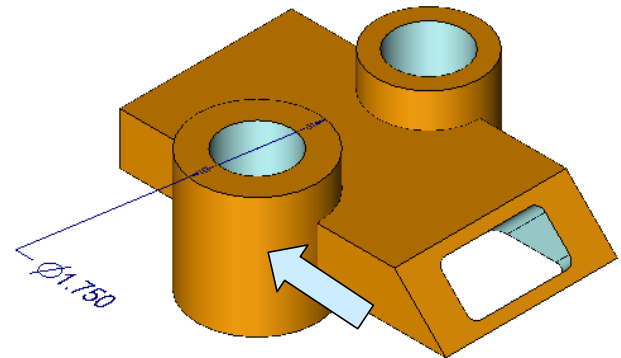


Click on the top, circular edge of the front cylindrical boss and move the cursor out, clicking to place a diameter dimension.

Now, click on the dimension text. You are prompted for a new value.

Type 1.750 and hit the ENTER Key.

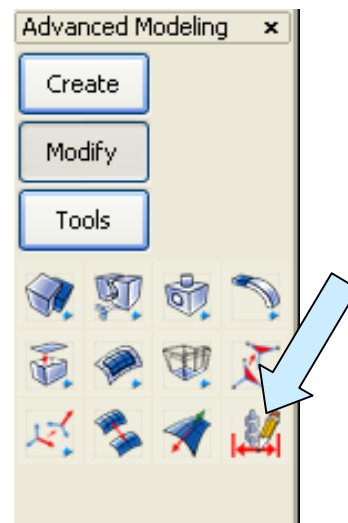
Notice that the front cylindrical boss grows to 1.75 in diameter.



Click on the UNDO Icon once to revert to the original part. With the 0.150 diameter dimension still on it.

Click on the DIMENSION DRIVEN EDITING Icon again.

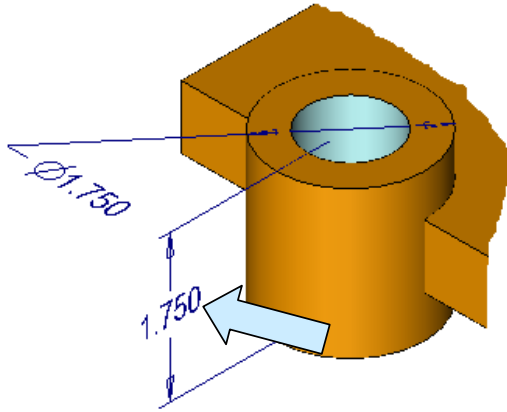
This time, click on the 0.175 diameter dimension.



Click on the ADD Button on the Conversation Bar and select the cylindrical face of the rear, cylindrical boss. Hit the ENTER Key.

Type 1.75 and hit the ENTER Key.

This time, both bosses grow to the new diameter.  
Once again, click on the DIMENSION DRIVEN EDITING Icon.

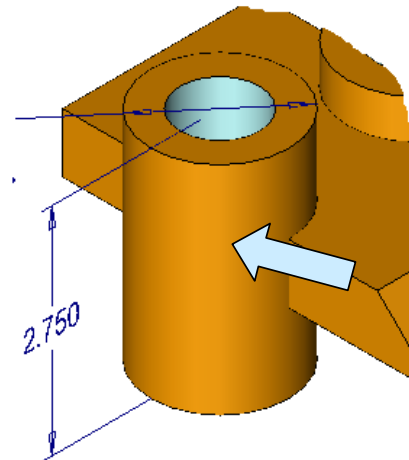


This time, click on the top, circular edge of the front cylindrical boss and immediately click on the bottom, circular edge of the same feature. (You'll see KeyCreator try to place another diameter dimension after you select the first edge. Ignore this and proceed to selecting the second edge.)

Move the cursor out and click to place a 1.750 vertical height dimension for the cylindrical boss.

Now, using the DIMENSION DRIVEN EDITING Tool, click on the dimension text of this dimension and type 2.75. Hit the ENTER Key.

Notice that the front boss grows to the new dimension symmetrically adding 0.5 inches to the top and bottom of the boss.

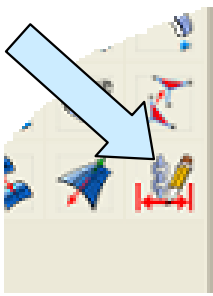


Click on the UNDO Icon once to revert to the 1.750 height.

Click on the DIMENSION DRIVEN EDITING Icon again and this time click on the top arrow of the 1.750 vertical dimension. Type 2.75 and hit the ENTER Key.

Notice that the front boss grows upward a full 1 inch with no length added to the lower portion. (If you had clicked on the lower arrow all of the extra length would have been added to the lower section.)

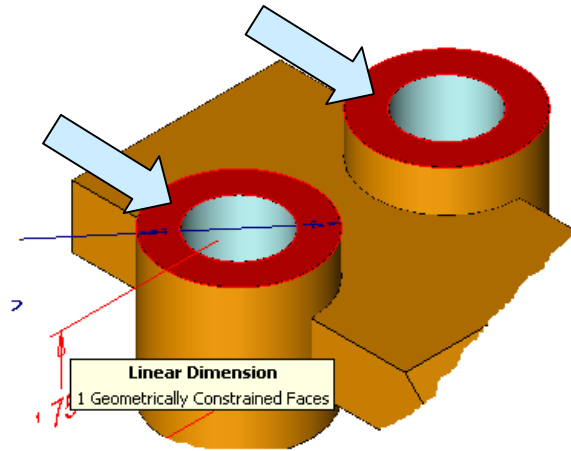
Click on the UNDO Icon again to revert to the 1.75 height.



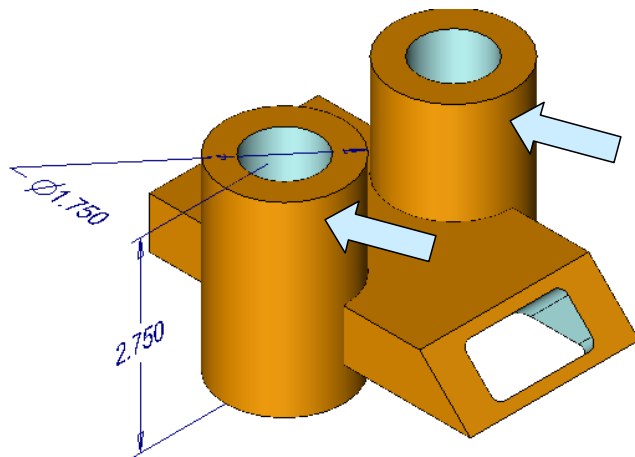
Let's click on the DIMENSION DRIVEN EDITING Icon again.

This time, depress the SHIFT Key while you click on the top arrow of the 1.75 vertical dimension.

Notice that both the top face of the front cylindrical boss and the coplanar top face of the rear cylindrical boss are selected.



Type 2.75 and hit the ENTER Key.



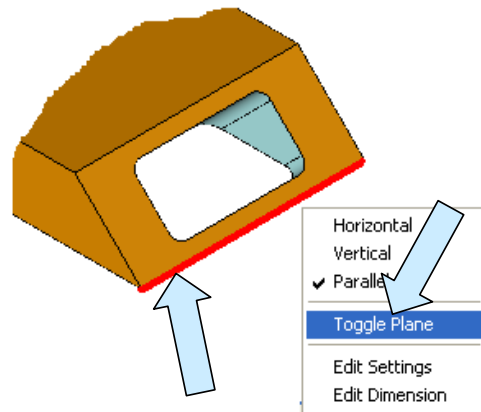
Both bosses grow to the new height with all of the extension added on top.

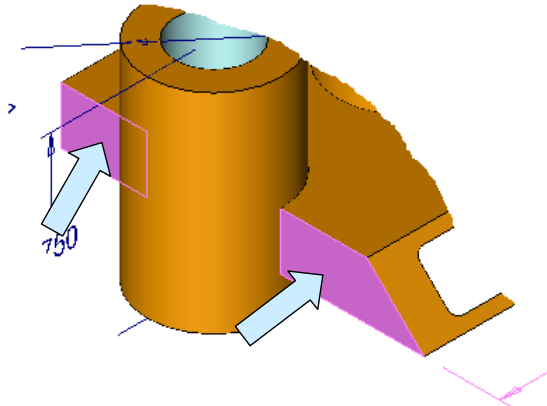
You will find that the ability to select coplanar faces by simply depressing the SHIFT or ALT Key while selecting a dimension saves a lot of time when modifying a more complex part.

Let's look at another slightly more complicated example of this:

Click on the DIMENSION DRIVEN EDITING Icon and then on the horizontal edge at the bottom of the sloped surface.

Move the cursor to pull off a dimension and Right Mouse Click to bring up an Options Menu. Click on the Toggle Plane Option and drag a dimension to the right along a horizontal plane.

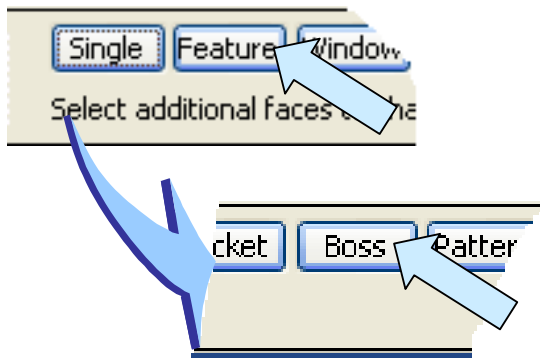
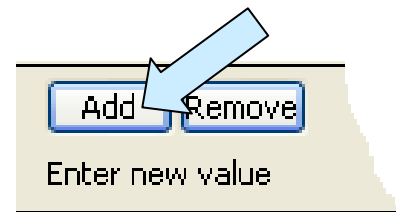




Depress the SHIFT and ALT Keys while you select the front arrow of this dimension.

Notice that both front, coplanar faces on the part highlight. If we typed a new value for the dimension now, just the base part of the block would grow forward.

To include the front cylindrical boss, click on the ADD Button on the Conversation Bar.



Now, click on the FEATURE Option and then on the BOSS Option.

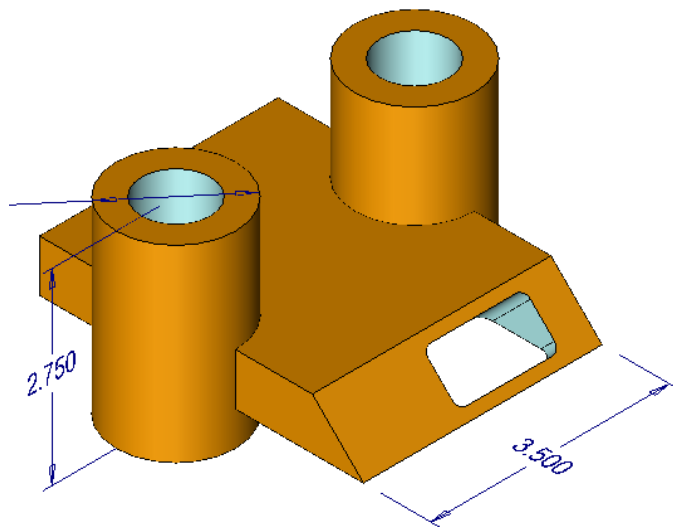
Move the cursor over the front cylindrical boss and click on it when it highlights.

Hit the ENTER Key three times. Type 3.5 and hit the ENTER Key.

The part grows to a dimension of 3.5 inches with the front boss properly positioned on the front edge.

Notice that the pocket on the right end of the part is no longer centered in the face since we did not include it in this operation.

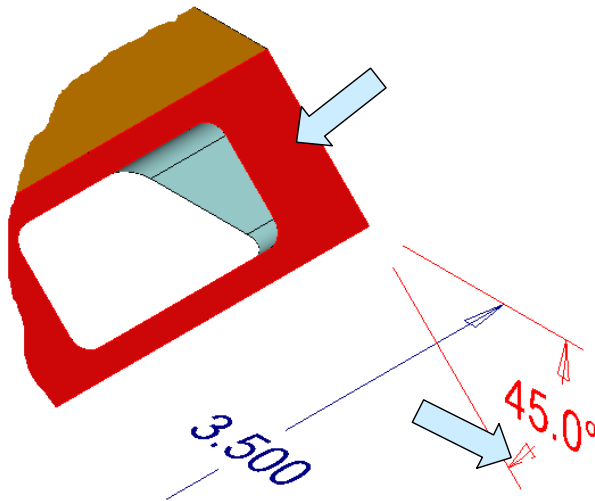
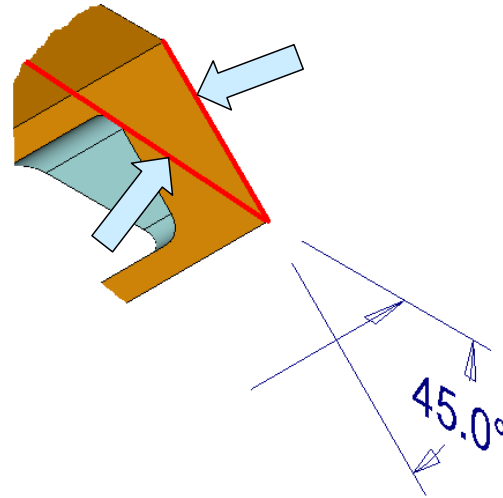
We could have selected it using a FEATURE, POCKET selection. You can try that on your own for further practice.





Let's do one more thing before we wrap up this exercise. Click on the DIMENSION DRIVEN EDITING Icon.

Click on the rear, sloped edge of the part and the rear, bottom edge and place a 45 degree angle dimension.



Click on the lower arrow of the 45 degree dimension to highlight just the sloped face.

Type 30 for the angle and hit the ENTER Key.

The part rebuilds with a 30 degree slope on the right end.

As you can see, the Dimension Driven Editing tool adds another level of capability to the already formidable arsenal of solids modification tools available in KeyCreator.

There are times when you may prefer to use the more traditional face manipulation tools that have been available for many years in both CADKEY and KeyCreator.

There are other cases where Dimension Driven Editing may be more appropriate. The beauty is that you get to decide what to use and when to use it. That's the freedom of working in KeyCreator that is not provided by any other competitive package!

