

### KEYCREATOR®

P=DV DV=000 mm CPL 3D D=0

**Test Drive Guide** 

### **ADVANCED MODELING**

www.kubotek3d.com

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No Snap

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Test Drive Guide

### CHAPTER 1 - Advanced Features.....Pages 4-36

In this first section you will learn how to utilize some of KeyCreator's more advanced 3D modeling features, such as:

Dynamic Transform Topology Imprint Prune Graft Unite Subtract Patterns Hole Feature

#### **Advanced Features**

Let's start by building a basic hinge model.

The status bar on the bottom right of the screen should indicate this as shown.



Keep in mind as you proceed that you can utilize the Modeling and Advanced Modeling Palettes to create and modify geometry.

Create	XForm				
Modify	Layout				
Detail	Tools				
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20					





Set the view to Isometric (View 7) by selecting Alt+7 on your keyboard or by selecting the double arrow beside the Disp View icon 🗼 and choosing '7: Isometric View' as shown:

Alt

Now set the construction plane (CPlane) to 1 by selecting Ctrl+1 on your keyboard or double arrows 💭 , of CPlane icon and choosing `1: Top CPlane' as shown.







Select Create>Primitive Solid>Block.

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Parameters		
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Select		
Anchor Positions		
Corners of		
Centers of	the edges	
Centers of	the faces and block	

Select a point for the first corner, another point for a second corner, then select a third and final point to place the block. You should see a dynamic preview as you do these steps.



Create a second block, similar to the one shown here. Place the first point of this block at the bottom edge Midpoint ('MID') of the first block. For the third and final point, let the cursor snap to the right top rear corner of the first block, as shown.



Let's center the top block. Select Generic Move  $\longleftrightarrow$  then select the top block. Making sure 'Cursor' is selected in the Conversation Bar at top left of screen, select the Midpoint of the bottom front edge of the top block. Drag the block and allow it to snap to the bottom front edge midpoint of the bottom block.

Cursor Point End Ent Ctr/Mid Intrsct AlongE Two Pos Offset Key In BackUp Esc Indicate base position/Indicate Position



Select Modify >Dimension Driven Edit.



Your model should look similar to the one below after adding the dimensions.



Staying in DDE mode, reselect the dimensions to resize the model to the dimensions shown below. If needed, re-center the top block.



Select `Delete Multiple' icon 4 along top and delete all dimensions.

Create some drafting dimensions by selecting the edges as shown.

Select Modify >Boolean >Unite

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4	2	Surface		۲	🐨 Intersect (Keep)
3	Ŋ	Solid Face	5	۲	Combine
j	2	Plane Display Scale			👯 Segarate
1	₹.	Vector		۲	🍝 Prune
I.	24	Dimension Driven Edit	Ctrl+D		着 Graft
đ	÷	Dynamic Face	Ctrl+W		

Select both blocks. Hit **Accept**. The two blocks are now one solid.



Select Create >Solid Feature >Blend >Constant Blend

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1								_	-	1	Vertex Blend	- 1

Place 12mm blends on the four base corners, and 25mm blends on the top block's two corners. The top edge will disappear.





**HINT:** Hit 'Backup' in Conversation Bar to change blend size while staying in function.





The model should now appear like this.



Hit Ctrl+1 to change the CPlane to Top.

Change the color by selecting the arrow by this icon **1** up top, which affects all new geometry.

Sketch a Primitive Block, placing the first corner at the edge midpoint as shown. Hold down the Shift key while placing the second corner as shown. You should see a 'NEAR' tooltip.





For the third point, hover the cursor over the top of the cylinder until you see the 'MID' tooltip.



Your model should look like this.



Using DDE 4, make the block 15mm thick. And 65mm FROM THE TOP of the cylinder.



**HINT:** Only highlight the bottom face of the block when editing the dimension.

Using Generic Move  $\longleftrightarrow$ , snap the midpoint of the new block to the midpoint of the edge it's touching, as shown.



Your model should look like this.



Delete the dimensions using  $\bigstar$  .



We will now create a pattern using the new block.

Select Create >Solid Feature >Patterns > Linear

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			-	Discover Featu	ires		۲	Spherical	
							Jan Barr	Curve/Ed	ge
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Specify options as shown.

nory concern	C		OK
Solids and Sheet Bo	dies		-
💮 Bump Features			Cancel
Check for and R	epair Self Intersection	s	Help
First Direction	1	25	
Second Direction	0	25	
	0	25	

Select the block, and Accept. To indicate the first direction, select the edge as shown and select Accept.



Select the second direction, select the edge as shown and select Accept. You must reselect the block and Accept in between direction 1 and 2.



Your model should look like this.



We will now use these blocks to cut through the model.

#### Select Modify >Boolean >Subtract



Then select the three blocks and Accept.



Select the base part as the solid to subtract from.



The model should look like this.







Select model then Accept.

Specify zero transparency for the entire body and hit OK.

Transparency		
Percent Transparent	Ō	ОК
<ul> <li>Entire Bodies</li> </ul>		Cancel
Individual Faces		Help



Create some Constant Blends on the edges as shown. 3mm for between the tabs, 5mm for the two long edges. You can select the edges through the model without rotating it.



We will now place some Counterbored holes on the model.

Select Tools > Feature > Counterbored Hole

B Options.



tab and change it.

Select solid to add holes. Make sure you're still on CPlane 1 (TOP).



cursor to snap Your model should look like the one below now.

You should see a preview of the cbore hole. Allow the cursor to snap to the 'CENTER' of each base corner radius. Place the four holes. Remember you can select edges through model.





**NOTE:** If you receive this message while trying to select an edge through the model, it means you've selected an incorrect edge that likely looks similar to the one you're trying to select. Try to select again or simply rotate the model.



#### Change to CPlane 2 (FRONT).

Place another M6 cbore through hole through the front top tab face. Again, allow the cursor to snap to the 'CENTER' of the cylinder face.



We will now edit a hole using parameters from an existing hole. Select Modify >Solid Feature >Hole



Your model should look like the one below now.



Select the hole on the rear tab, as shown, and Accept.



Select the Actions tab, and select Get parameters from another hole.

Select one of the four base cbores. Hit OK.

ole 🗡 🧹			Hole
Parameters Actions			Parameters Actions
Drill Diameter	6.4		Move
and Condition	Through	~	Remove
Depth	17.5		Create new holes
Drill Point Angle	180		Modify other holes
CBore CSink CSink CDrill CDrill Standard	METRIC CLOSE M6	× ×	Get parameters from another hole
U oril U Iap M Pipe	Apply	Help	OK Cancel Apply Help

Select the face of the rear tab to indicate on which face to put the cbore. Accept.





Your model should look like the one below now.



We will now imprint a line onto the model to create new edges that separate existing faces. This allows geometry to easily separate from the model.

Select Modify >Topology >Imprint

XXX	tify Detail Transform Trim Break Eillet	Layout As	semblies Compare	
نے ج	Spline Curve Boolean	B	_	Select Intersect solid with a plane.
関節へ	Solid Trim/Break Solid Feature Warp	X M		Imprint Curves onto a Solid
· · · · · · · · · · · · · · · · · · ·	To <u>p</u> ology Surface Solid F <u>a</u> ce Plane D <u>i</u> splay Scale	, 5 †	<ul> <li>∑ Unstitch</li> <li>∑titch</li> <li>∑ Imprint</li> <li>∑ cribe</li> </ul>	<ul> <li>Project curves onto a solid</li> <li>Intersect solid with a plane</li> <li>Intersect two solids</li> </ul>
之 編 参	Vector Dimension Driven Edit Dynamic Face	Ctrl+D Ctrl+W		

Select a face at the base of the tabs, as shown. Use spacebar to toggle through selection options if needed.



Select the solid for imprint.



#### Your model should now look like this.



We will now perform some 'cut & paste' type functions, using geometry on the model. Select Modify >Boolean >Prune Select **'Cut**', **'Feature**', and **'Boss'**. The geometry we are cutting satisfies the 'boss' characteristics.



Select the front and rear tabs. Hit Accept 3x to complete operation. These bosses are now separate solids. Select Transform >Dynamic to move the separate solids around. Hit ESC when done. If you hit Accept select undo before going to the next step.





#### Select Modify >Boolean >Graft

Select the target face as shown.



Select the opposing face (bottom face of boss) as shown. Use spacebar to toggle through selections if needed.

Esolid Face



Select the midpoint as shown for boss base position.



A 3D Handle will appear at the midpoint. Click & drag the arrows to manipulate the boss.

The red and green arrows move only along their indicated axis.





The yellow sphere moves the entire part anywhere it is dragged.

The blue arrow rotates.





Click & drag the yellow sphere to move the boss to the position indicated below and hit Accept.

To temporarily turn off position snapping, hold Ctrl while dragging the part.



Select the Delete Multiple icon 🚽



Hover the cursor over the new tab and use spacebar to toggle until only the tab is highlighted. Select and hit Accept. This deletes the extra copy of the geometry that grafting leaves behind.



Now the newly-placed tab is unified again with the base as one solid.



We will now move the other boss, using Dynamic Transform. Select Transform >Dynamic Rotate the model for better viewing of the boss. Select the remaining boss and Accept.



The 3D DynaHandle appears at the midpoint. This handle behaves similarly to the Graft 3D handle, except all three axes can rotate independently.

Move the boss to the indicated position. Allow it to snap to the edge midpoint.

Select the midpoint as shown for the base point.



Select the Red rotation arrow with the Left Mouse Button and hold it down and drag until the X Ang=90.



**HINT:** The angle will rotate at 5 degree increments by default.

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Right-click the Green rotation arrow as shown. Select the first option 'Indicate Y Angle'. Enter 90, Accept, then Esc. in the conversation bar.



We must unite the two solids. Select Modify >Boolean >Unite

Select the large green solid and the boss, and Accept.



Model should now look like the one below after moving the boss.



This is now one solid as shown below.



We will now use the Remove Feature function to simplify the model geometry.

Select Modify >Solid Face >Remove

Select 'Feature' to specify the type of faces to be removed, then select 'Pocket'.

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17.	Chamfer	,		
2	Spline	•		
	Curve	•		Single Feature Window Polygon Group Plane All Dsp
-	Boolean	вÞ	-	Select the faces to be deleted
ST.	Solid Trim/Break	×۲		
ST.	Solid Feature	M		
3	Warp	•		
Ŧ.	Topology	•		
*	Surface	•		
曊	Solid Face	S P	🐨 Remoye Ctrl+R	Smooth Bump Blend Side Rib Pocket Boss Pattern Primitive
X	Plane Display Scale		🗑 Extrude	
12	Vector	•	Bevolve	Choose face chain option
124	Dimension Driven Edit	Ctrl+D	🕬 Sweep	
	Dynamic Face	Ctrl+W	1 Offset Body	<b>NOTE:</b> A 'Pocket' is characterized by a
			+ Offset Faces	
			f Iransform	group of faces that form a cavity in the
			Keplace Faces	model
			1 Taper	moden
			Shadow Taper	
			The Deform Fares	
			Smooth Faces	
			Thicken Sheet	
			A Under Dieer	

Hover the cursor over the model and select the Pocket as shown. Tooltips should appear saying how many faces compose each pocket.



Hover the cursor over the model and select the Pockets as shown. Accept  $3 \ensuremath{x}.$ 



After the three pockets are removed, your model should look like this.



Staying in the Feature Removal function, reselect 'Feature' then select 'Bump'.

Hover the cursor over the model and select the four cbore hole `Bumps'. Accept 3x.



We will use Prune to remove the remaining holes. Select Modify >Boolean >Prune Select 'Cut', 'Feature', and 'Bump'.

> Modify Detail Transform Layout Assemblies Compare Tools X Irim Т X Break K I Eillet Chamfer No. Spline Curve Boolean B 🕝 Unite 🗐 Solid Trim/Break X۲ 🚮 Unite (Keep) 💐 Solid Feature Subtract M P ( Subtract (Keep) Narp <u>W</u>arp 👸 Topology Intersect 🙊 Surface 🐨 Intersect (Keep) 5 🕨 🎇 Combine Solid Face 🏹 Plane Display Scale Separate Vector ٠ 🚠 Prune 🚠 Graft Dimension Driven Edit Ctrl+D 📥 Dynamic Face Ctrl+W

**NOTE:** A 'Bump' is characterized by a group of faces that compose either a cavity or a protrusion on the model.

Your model should now look like this.



Select the remaining holes as shown. Hit Accept 3x.



The Prune function fills in the holes, leaving behind the hole geometry. This geometry can be moved, deleted, hidden etc.



Use Generic Move to move the model away from these hole geometries.



To unhide a previously-blanked entity, select the 'Unblank Entities'

icon 🦥 . All blanked/hidden entities will appear in black. Select which entities you wish to unhide and Accept.



You can either use 4 to delete this geometry,

or select the 'Blank Entities' icon  $\bigotimes$  to temporarily hide it.

Once you select the Blank Entities icon, select 'Blank'. Now select the hole geometries and Accept.

Blank	Not Blnk	All Bink
Select bla	ank type	

We will now turn this model into a sheet metal part. Some edits must be made first.

Use DDE to select the tab edges shown. Change distance to 25.



The tab should now look like the one below.



Make sure you highlight only the face shown. Edit both tabs. Delete dims afterward.



Do the same for the tab on the other.



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#### Select Modify >Solid Face >Remove

Select 'Feature', 'Pattern', and 'Faces'.



Select one of the base 12mm blends. All others should highlight. Hit Accept 3x.



The solid should now look like the one below.



Create 3mm blends 🦻 on the two edges, as shown.



Select Modify >Topology >Unstitch

Select options as shown.



Select 'Feature', 'Smooth', then hover mouse over model until you see this selection of one continuous smooth group of faces. Accept 3x.



Solid should now look like the one below.



Delete  $\checkmark$  the solid below.



Select Modify >Solid Face >Thicken Sheet Specify 2mm for thickness. Select the top sheet just created, then the downward arrow.



Change the color up top for new geometry. Make sure you're in CP=2. Sketch a primitive block as shown.

Hold Shift key while placing 2nd corner.



The solid should now look like the one below.



Select the 3rd point as shown.



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Model should now look like the one below.



Use DDE to make the block width 3mm. Only highlight the right side of block to keep the left side stationary with the dim change.





Select the CPlane 🔍 🖡 icon.

Select the face shown below to position CPlane.



Select Transform >Mirror >Copy Select the new block and Accept. Select `1 Position Vertical'.



1 Pos H	1 Pos V	2 Pos	Plane	

Choose method for defining mirror plane

Select the indicated midpoint, then Accept.



#### You should see this.



Select Modify >Boolean >Subtract

Select the hinge, then box-select the entire model to select the two blocks to subtract. Accept.







Highlight and select the bottom tab face. Use 'ADD' to include all tab faces as shown.





#### Change to 30mm.



Do the same thing to both tabs.

The model should look like the one below.



#### Select Modify >Solid Feature >Sheetmetal Bend

Select options in dialogue box as shown.



Select the blend as shown.



Select the tab to bend, as shown.



You should now see this. Apply to other side of model.



Your model should now look like the one to the left.



Select Modify >Solid Feature >Unbend All Select options as shown.

Modify Detail Transfor	rm Layout Assembl	ies Compare Tools A	
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🗙 Break	к м 📥 👘	<u>.</u>	<i></i>
Eillet	•		One Step Unfolding
Chamfer	•		Parameters
Spline	•		
Curve	+		
Boolean	в •		K-Factor 🗸 0.5
Solid Trim/Break	x +		Create these bend lines when flattening
👰 Solid Feature	M 🛛 🚿 I	Hole	Start line
Warp	• 🚅 8	Blend	Centerline
Topology	و 😻 ا	Chamfer	
Surface	• 😹 s	Sheetmetal Bend	End line
Solid Face	s 🕨 🥳 y	Unbend All	
🏹 Plane Djsplay Scale	0	Suppress Feature	OK Cancel Help
Vector			
Dimension Driven	dit Ctrl+D		
📥 Dynamic Face	Ctrl+W		

Select the face to unfold from, as shown.

You should now see this. You may need to unfold a few times in segments. Simply keep selecting a top face.





Please watch for future updates on our website as we continue to add more functions and subjects for you to try.

### More KeyCreator Training:

Kubotek University

Training

# www.kubotek3d.com

