

# Description

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**M**acros

**V**ariables

**C**onditions

**E**xample cut

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## Task:

In a profile, band holes must be drilled for two hinges. These should be programmed and stored once as one macro and once as two macros. The profile cuts must be variable in length. Starting from a length of 1000 mm, holes for a third hinge must automatically be inserted as a condition.



*These band holes for the hinge form a macro*

## What is a macro?

A macro primarily serves to insert frequently used groups of process steps onto the profile quickly, e.g. lock cylinder and the insertion hole for the lock.

The macro consists of a group of process steps that are stored to form a unit – the macro. This macro can only be translated along the three X, Y, and Z axes. The depth of the process steps can also be specified. These specifications then apply to all process steps that belong to the macro. All other coordinates must be specified in the individual process steps.

Changes to the macro, such as the distance between 2 process steps, can only be changed by converting the macro back into the original "group of processes" and saving it again.

Navigation										
No.	Active	Name	Prio.	Side	X	Y	Z	Depth		
	<input checked="" type="checkbox"/>	Group (Door ...)	0	Multi side	0.0	0.0	0.0	0.0		
	<input checked="" type="checkbox"/>	Drill	0	top	100	20	0.0	3.0		
	<input checked="" type="checkbox"/>	Drill	0	top	150	20	0.0	3.0		
	<input checked="" type="checkbox"/>	Drill	0	top	CLength-150	20	0.0	3.0		
	<input checked="" type="checkbox"/>	Drill	0	top	CLength-100	20	0.0	3.0		

Groupe/Macro

Processes

## Processes in a macro

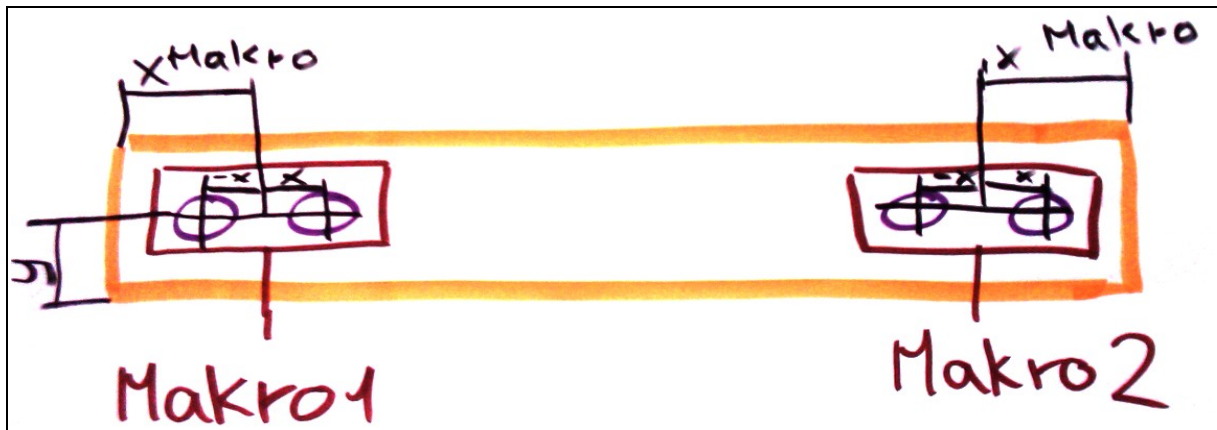


There is where all the process steps for the two hinges are stored in a macro.

The dimensions for the hinge holes are each entered once on the left and once on the right of the outer edge of the profile - that keeps the distance to the edge constant.

Since the right position of the macro is already defined by the individual process steps (distance of the holes from the edge), no coordinates need to be entered for the macro itself, X=0.

## Processes in two macros

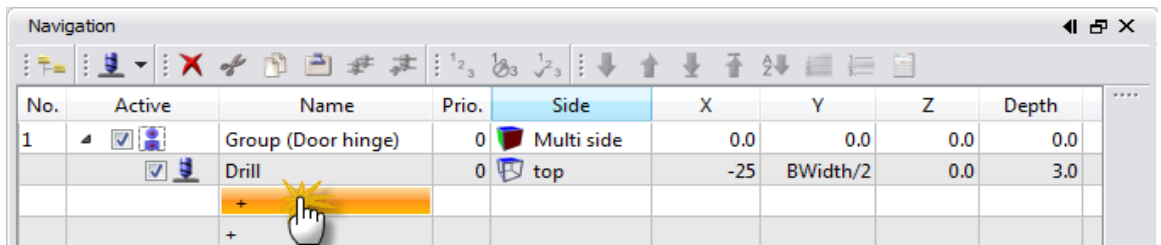


If you want to set each hinge individually, splitting the process steps into two macros is the best options.

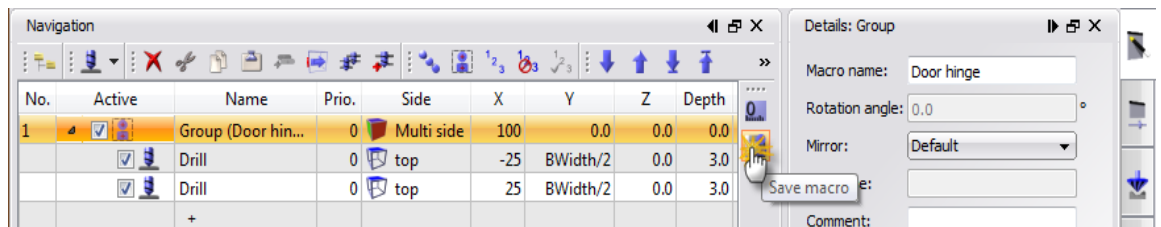
You program the hole spacing of the hinge, store that as a macro and copy it again. Now the coordinates can be entered for each individual macro, and it can be put wherever you want it. For example, on the top the middle of the macro is right in the middle between the two holes.

## How do I create a macro?

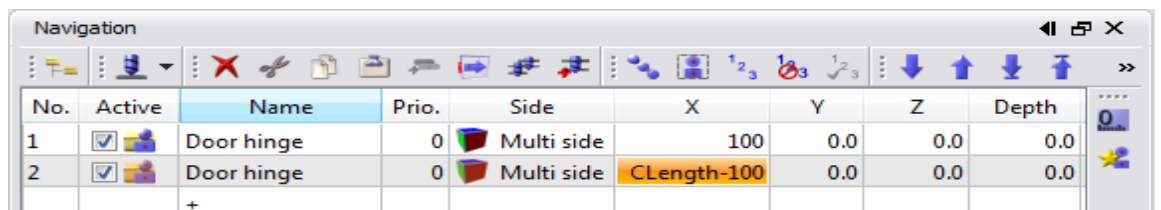
**Step 1:** Create a group with a meaningful macro name and add the process steps for the macro by clicking on the "+" under the group.



**Step 2:** Enter the exact coordinates of the holes and save the macro

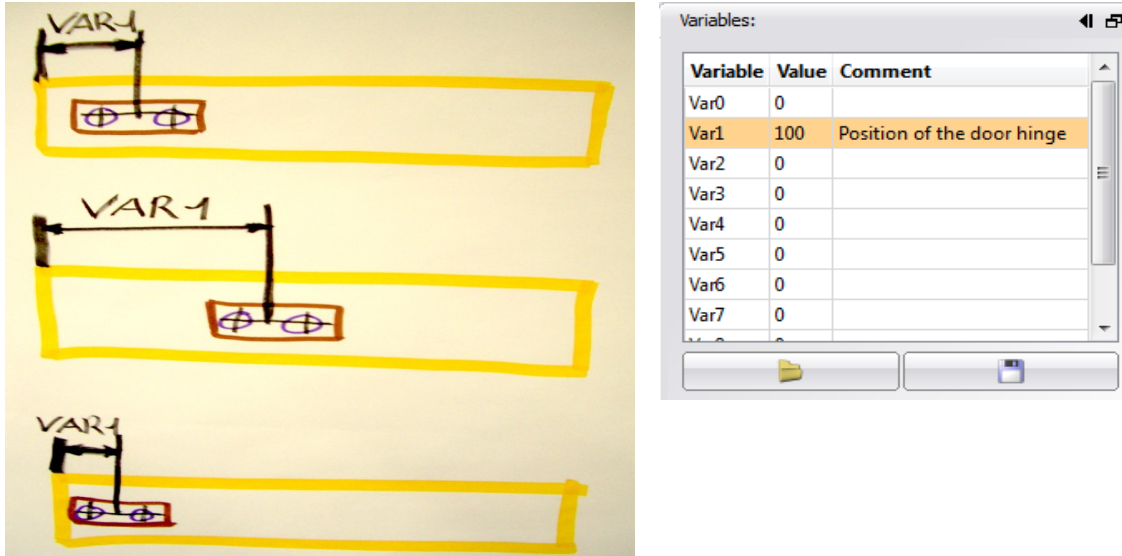


**Step 3:** Now copy the macro and enter the coordinates for the positions of the individual macros.



## What is a variable?

A variable is a placeholder for changing numeric values. That means that you define a variable in a table with an abbreviation - e.g. the location of a door hinge on the profile is "VAR1". The X coordinate in the macro has no numeric value entered, just the name "VAR1". When the customer wants to have the door hinge in a different location, he or she doesn't change the numeric value directly in the macro, but rather in the table, where we have entered the value for Variable1 = VAR1. The result: Every macro with the variable "VAR1" changes its position to the specified value.



*The position of the macros (door hinge) is specified in this example with a variable (VAR1). The macro can then be moved back and forth by changing the value in the table (right).*

## How do I create a variable?

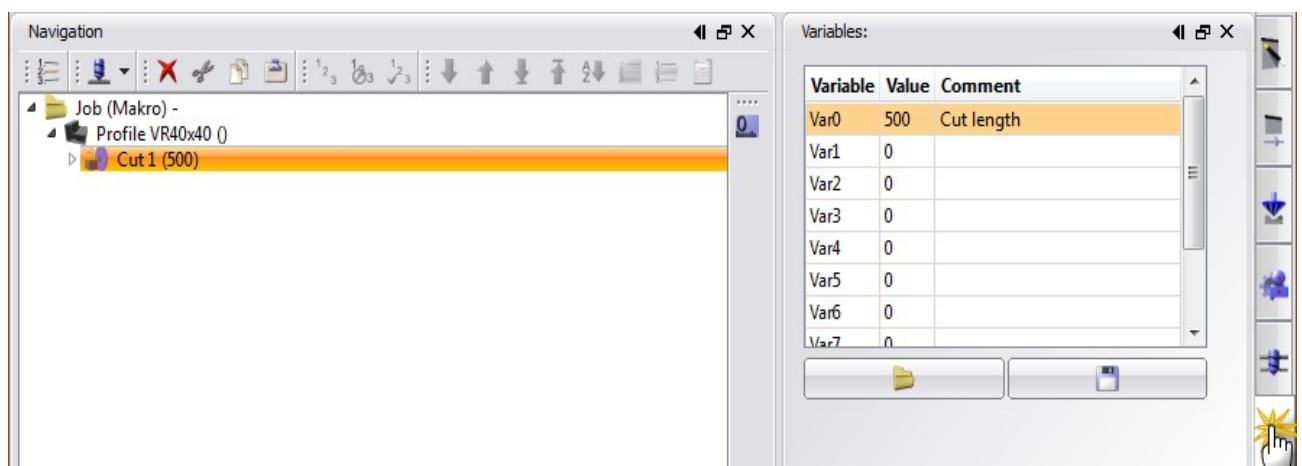
**Step 1:** Click on the part to be fabricated, then on the "variables" icon on the toolbar on the right.

The terms in the table have the following meanings:

"Var0, Var1, Var2", etc. are the names to be used instead of a numeric value.

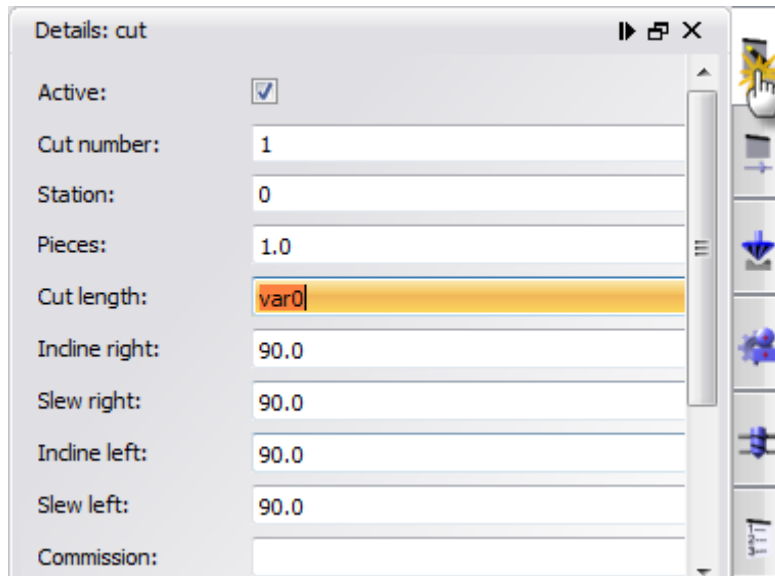
"Value" is the numeric value (in mm) for which the name stands.

"Comment" is a description of the variable.



**Step 2:** Click on the "Detail" icon on the toolbar on the right and enter the name of the variable into the "Cut length" field → e.g. VAR0.

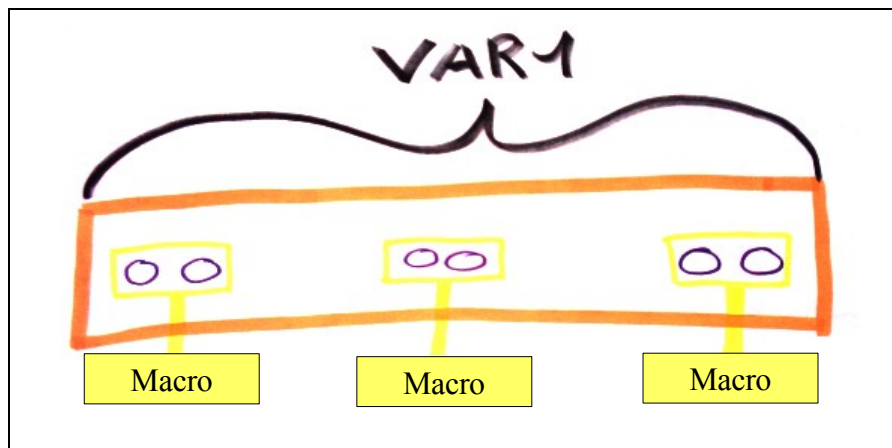
The cut length is now 500 mm, the value you entered for the variable.



## Variable with condition

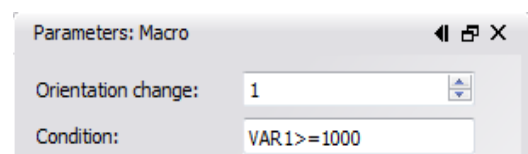
EluCad offers the option of setting conditions.

For example, you can specify that a process step should only be carried out above a certain profile length. For example, if you have a box with a cover on which band holes should be drilled for two hinges, you can set a condition that holes should be drilled for a third hinge above a certain length.



Example:

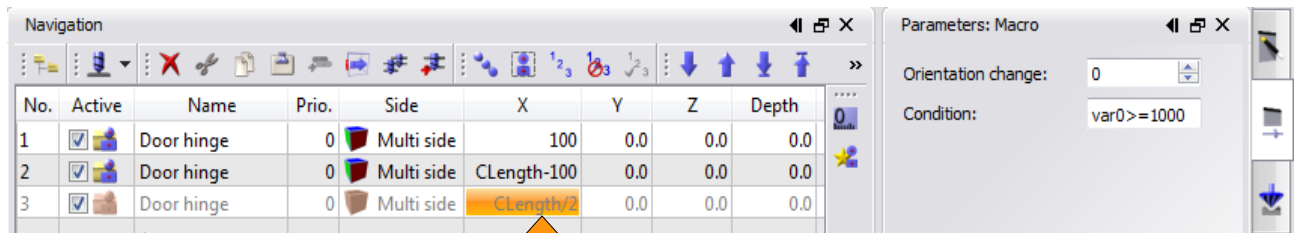
1. Both external macros will always be added to the profile.
2. The macro in the middle will only be added if the total length of the workpiece (VAR1) exceeds the value we specified as the condition for this macro.



*The cut length (VAR1) must be greater than or equal to 1000 mm. Above that size, the middle macro in our example will also be placed.*

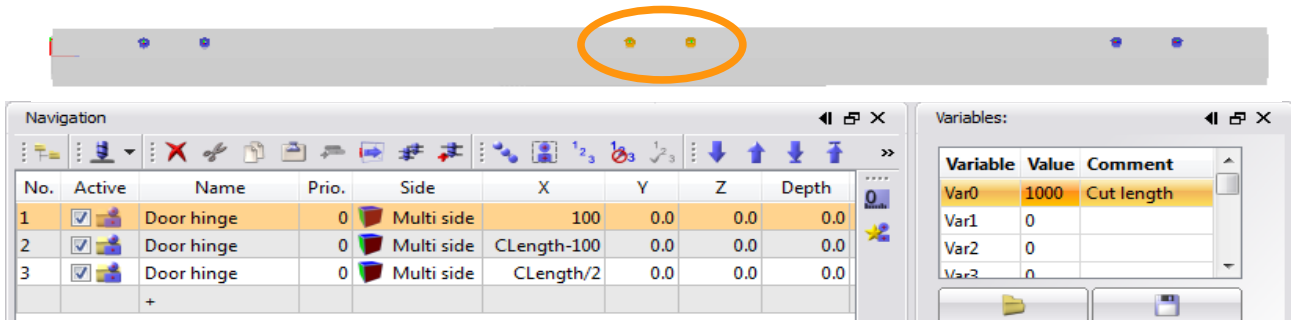
## How do I create a condition?

- Step 1:**
- Add a third macro (door hinge). This hinge should always be added in the middle of the profile above a length of 1000 mm.
  - To do this, we click on the third macro and enter the coordinates. Since it should be added exactly in the middle, we have to create a mathematical formula.
  - Now click on the parameters of the macro and enter the condition.
  - The mathematical functions you will need can be found at:  
<http://www.elusoft.de/de/support/math-funktionen>



Total length(CLength) : 2 = X

- Step 2:** If you set the value of the variable to 1000 mm or greater, the third macro will be added.



## Example of variable with condition

**Holes 1 and 5** must always be drilled. Since these have dimensions, it is enough simply to specify the coordinates. No condition is needed.

**Hole 3** should only be drilled above a length of 1500 mm. We need a mathematical formula to do this, since the hole does not have dimensions.

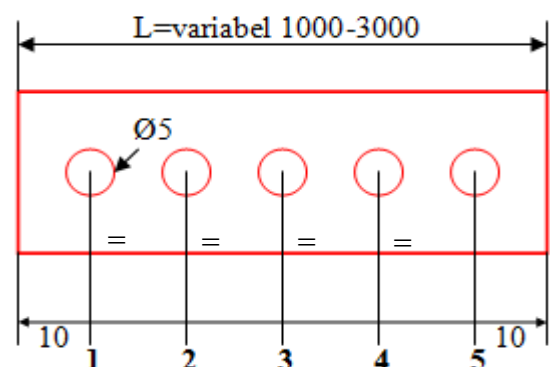
Formula for the X coordinate: CLength/2  
 Condition: VAR1 >= 1500

**Holes 2 and 4** should only be drilled above a length of 2500 mm. We need a mathematical formula for this, too, since there are no dimensions.

Hole 2 Formula for the X coordinate: (VAR1-20)/4+10  
 Hole 4 Formula for the X coordinate: ((VAR1-20)/4)\*3+10

Condition: VAR1 >= 2500

L = variable 1000-3000



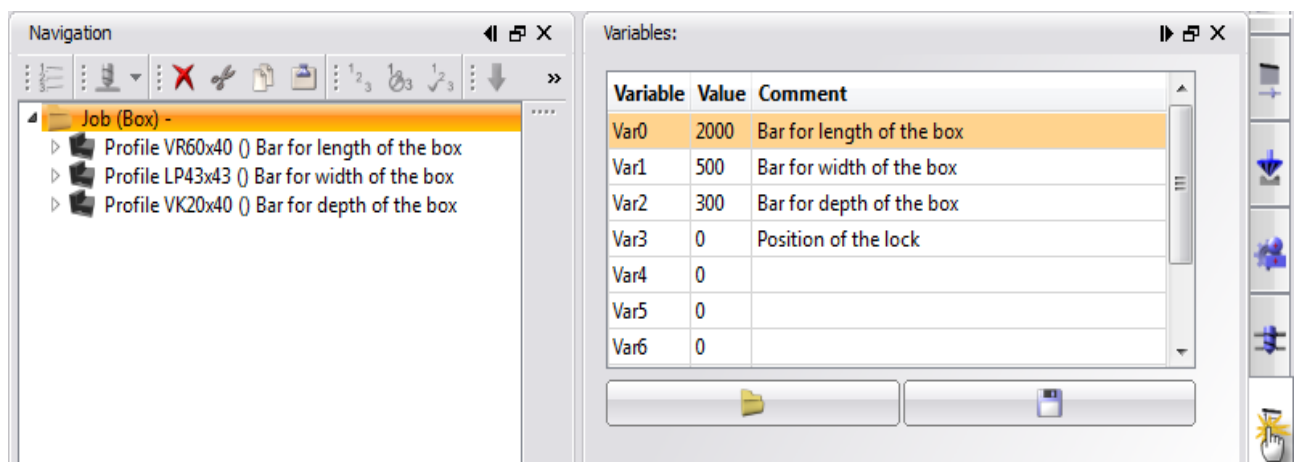
## Example Cut

The example cut is a box of variable size. Four L profiles are needed for the depth and twelve square tubes each for the width and length of the box. It should be lockable and have two or three hinges and one or two cylinders on the cover according to its size. The process steps we will need must be programmed with macros, variables and conditions, so that the process steps always retain the right positions.

**Step 1:** Create all the profiles you'll need to build the box in one job.

In the comment, enter the name of the specific profile it pertains to - this will preserve a clear structure for the job.

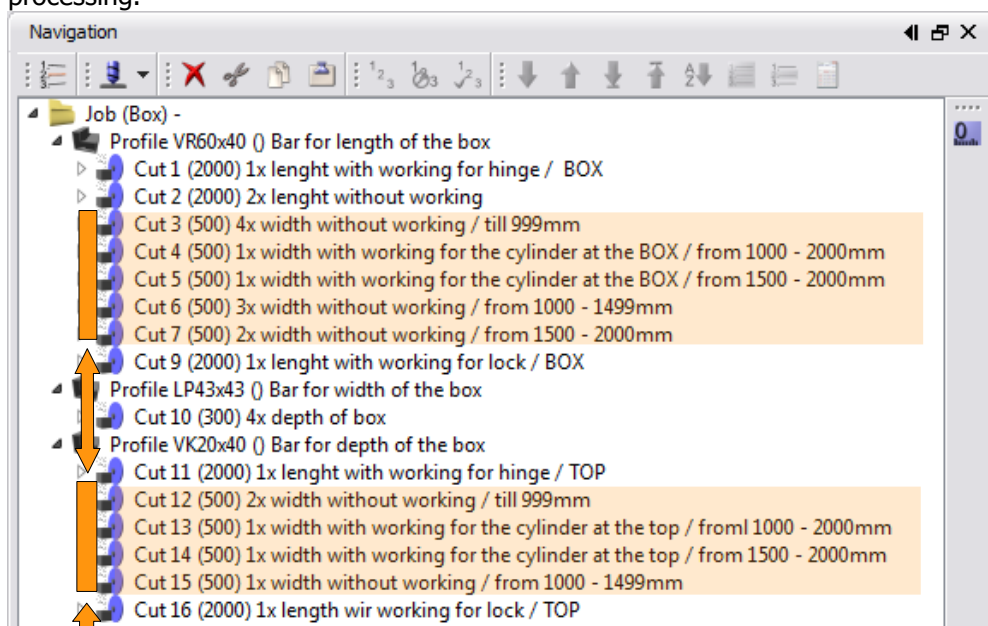
Define variables for all the important profiles that should be able to change. (Length of the box, width of the box, depth of the box, and location of the lock)



**Step 2:** Create each cut with a description and the required process steps.

Assign the corresponding variables to each.

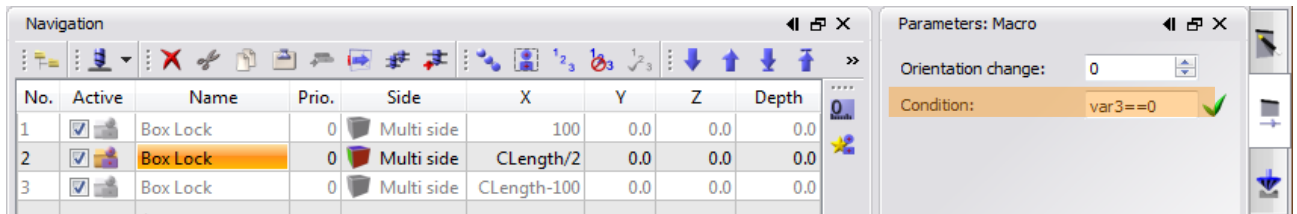
Note that you only need the process steps for the cylinders above a certain box length, and some cuts for the cylinders must therefore be created twice - once with and once without processing.



The cuts highlighted in colour must also be programmed, since they can be deactivated or activated depending on the length of the box and the resulting changes (addition of cylinders)

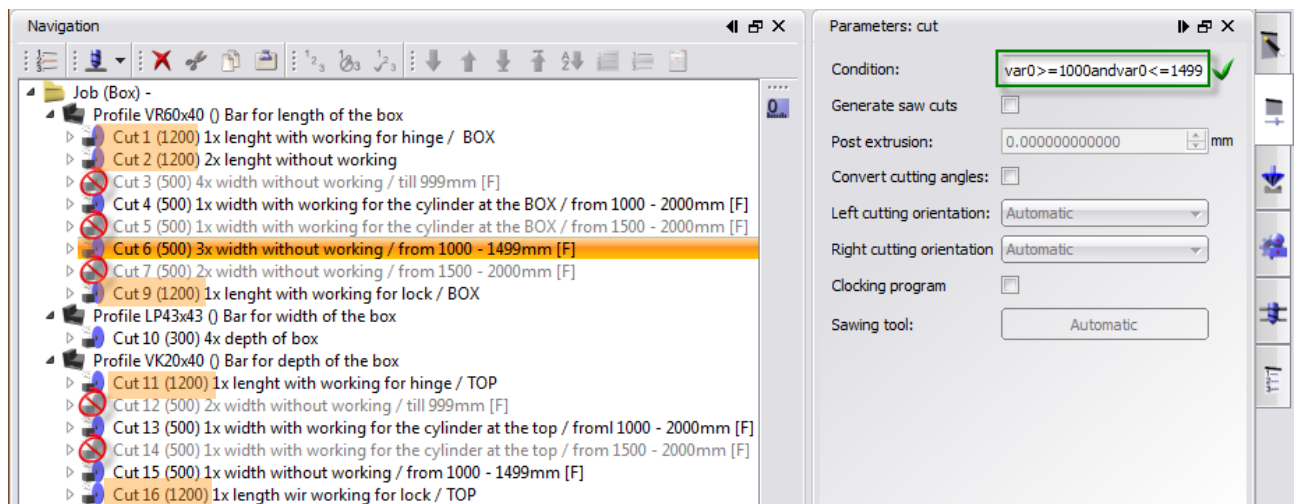


**Step 3:** For cuts 9 and 16, the lock should be created with a condition that it should appear in the middle of the profile for the value "0", to the left for a value of "-1", and to the right for a value of "1".



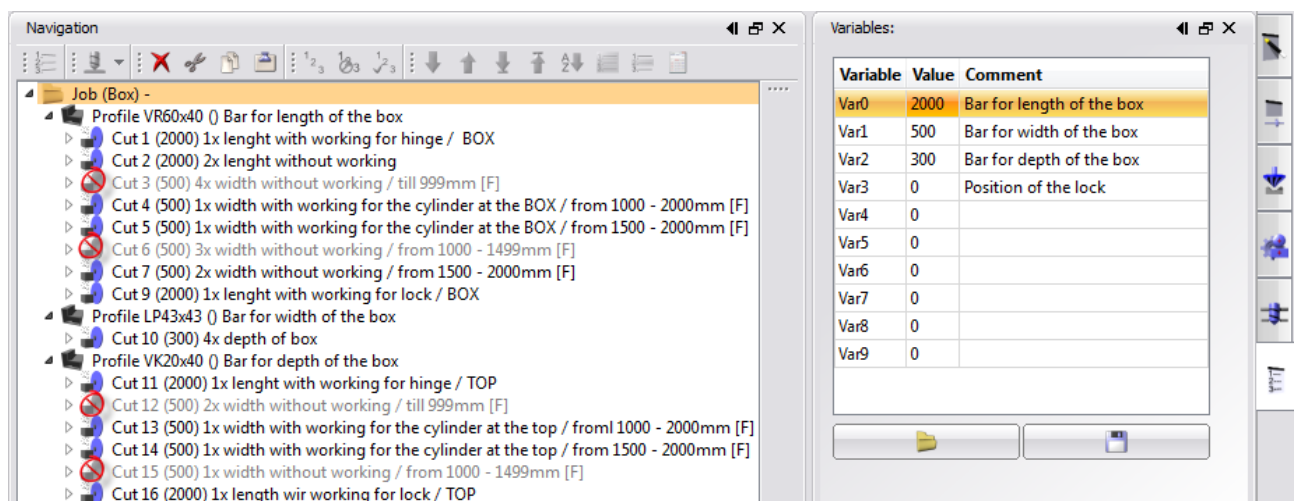
Add "box lock" macro 3 times into the part and define a condition for each macro. Thus only the lock macro is active that you select using the variable (-1, 0, 1). In the X coordinate, enter the position of the macro (lock).

**Step 4:** For cut 6 (box) and 15 (cover), the condition must be set up in such a way that the macro is only activated above a box length of 1000 – 1499 mm. Above 1000 mm, the first cylinder is added (see parts 4 and 13), so cuts 3 (box) and 12 (cover) must be deactivated.



The length of the box has now been changed in the variables to 1,200 mm - so that cuts 3, 5, 7, 12 and 14 are automatically deactivated.

**Step 5:** Specify the conditions for the remaining cuts and save the job.



Here, the box is 2000 mm long - so that cuts 3, 6, 12 and 15 are deactivated. All cuts with a question mark after the description have a condition.