



HYBRID COMPONENTS
CAMBERING MACHINE
MCCH 150 :

USER'S GUIDE

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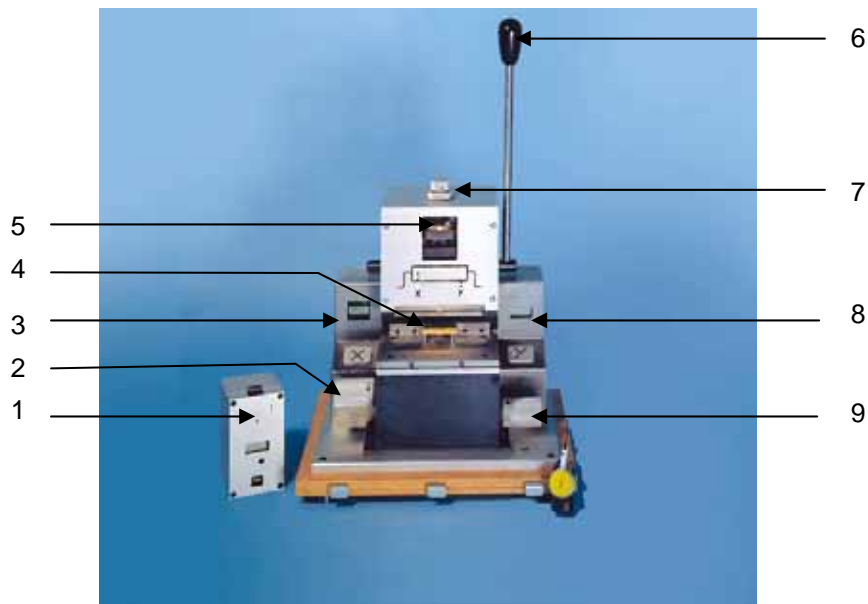
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HYBRID COMPONENTS CAMBERING MACHINE MCCH 150

Presentation of the machine

MCCH 150



Numéro	Description
1	Ribs verifier
2	X knurl
3	X comparator
4	Support pawn on which the component is placed
5	Spring pressure knurl*
6	Lever
7	Cut block screw
8	Y comparator
9	Y knurl

** The first position is generally the most suitable,
however, tests can be realized*

Characteristics

Dimensions : 350 x 300 x 350 mm

Weight : 35 kg

Use

This machine allows to camber legs of all hybrid casings with a high accuracy, without any risk of break or crack of the glass pearls maintaining the connections through the casing, with variable heights.

It is used to prepare traditional components for surface mounting as well as all hybrid casings, including « fine thread » casings without the need of an additional tool at each component change.

Thanks to its correction capabilities, the MCCH 150 can ensure a true parallelism and stability of the components on the PCB.

Advantages

- Completely self-contained and autonomous machine
- Accuracy to 3/100ths
- No risk of glass pearls break
- Operating parameters clearly displayed
- Cambering and cutting are made simultaneously
- No break risk due to the machine
- Can be used for the smallest component until 149 x 149 mm
- The lever can be placed as well on the left as on the right. So the machine is easily usable for right-hander or left-handed.

Ribs verifier (or X measure sensor)

The ribs verifier permits to measure the dimension X (which corresponds to the height between the bottom of the casing of the component and its legs) so that it can be transferred on the machine to realize the cambering of the component. It is essential that this measure is correctly realized, so the verifier must be calibrated very well.

The measure is made thanks to a push button which will palpate the dimension between the bottom of the casing and the legs.



X measure sensor

Cutting system

When using the cambering machine, cambering and cutting operations are made simultaneously.

However, it is possible to block the cutting system thanks to the button located on the top of the machine (n°7).

By turning this button, a block wedge rises up, staving off the way-down of the cutting blade and so the cut of the legs.

How to block the cutting system of the machine ?

- 1) Undo the lock nut and turn on the right
- 2) Realize tests with the lever so that the cambering is done but not the cut
- 3) Once the setting is found, block the lock nut



Zero setting of the origins

Calibration of the blades

- 1) Place the comparator on the support pawn and check that it is on 0. If not, turn the dial of the comparator and place it on 0.
- 2) Make the same verification for the forming anvil and the cutting anvil by placing the comparator in the middle of it.



Step 1



Step 2

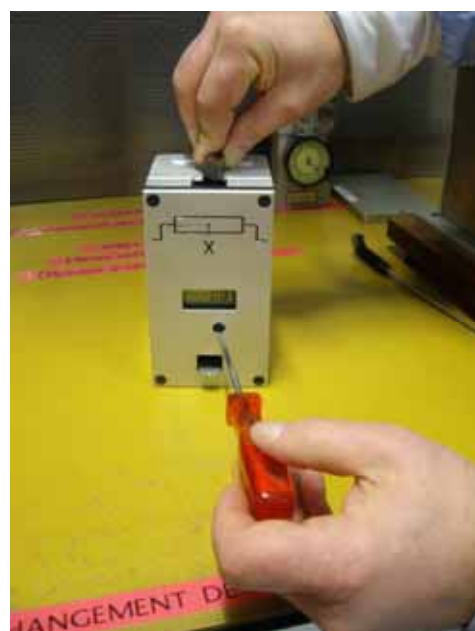
If you notice that the blades are not well settled, set them thanks to the X knurl for the forming anvil and the Y knurl for the cutting anvil. Then, take off the lateral fairings and push on the GO button of the X and Y comparators so that they are set on 0.

Calibration of the X measure sensor

- 1) Place the wedge on the sensor and check that the display indicates 0
- 2) If it does not indicate 0, press on the button located under the display thanks to a tool (for example a screwdriver) to put the display back on 0.



Step 1

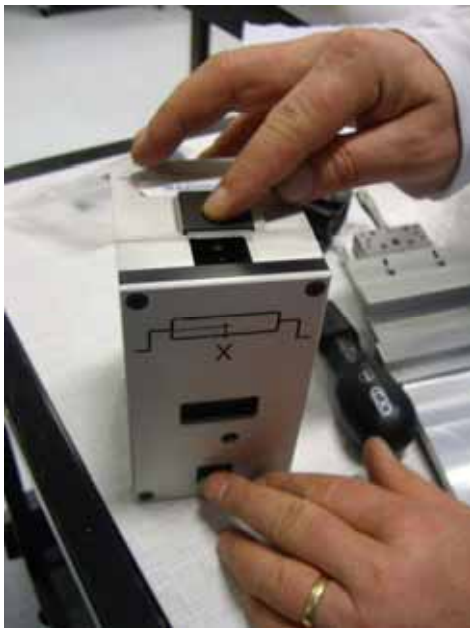


Step 2

Cambering process of a component

- 1) Measure the rib X of the component thanks to the sensor
- 2) Transfer the X measure on the X comparator
If the component has to be heightened, transfer the Y measure on the Y comparator
(Y corresponds to the extra height of the component)
- 3) Place the component on the support pawn by maintaining it thanks to the finger
- 4) Always by maintaining the component, pull down the lever

Then, the component is cambered and its legs cut!



Step 1



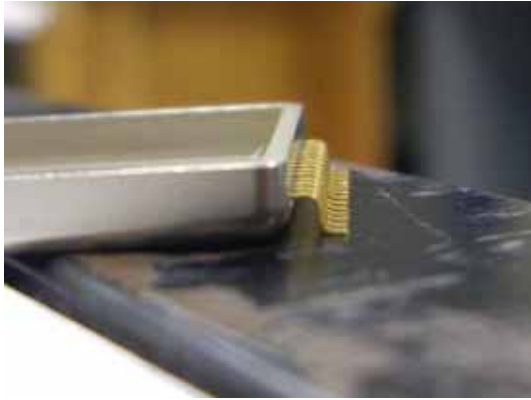
Step 2



Step 3



Step 4



Cambering result

Particular case of a component with the legs on the bottom

Classical use of the cambering machine

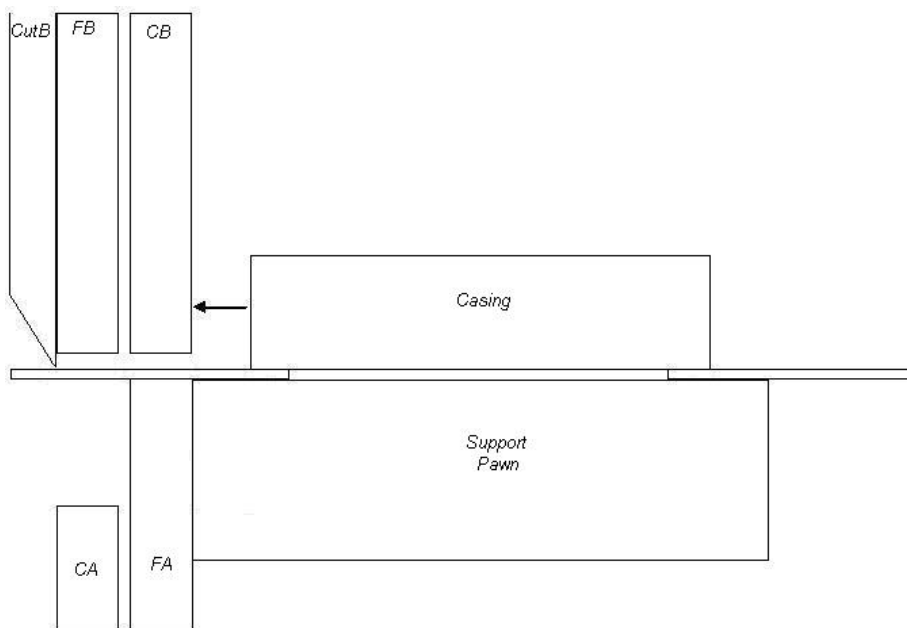
The cambering process of components of which the legs are located on the bottom is a bit different from the process with the other kinds of components (legs in the middle or on the top).

With this configuration, there will not be any setting of X to do, as the legs will lie on the support pawn, first calibrated to 0. So the X comparator will have to be settled on 0.

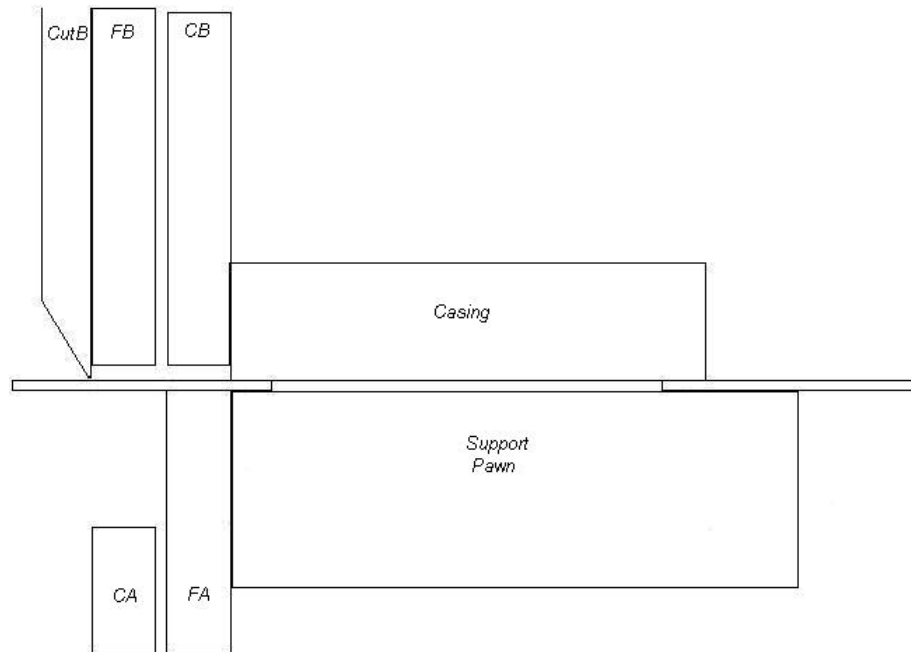
However, it is still possible to raise the height of the components compared with the PCB by using the Y comparator.

To camber this kind of component, you have to proceed in different steps.

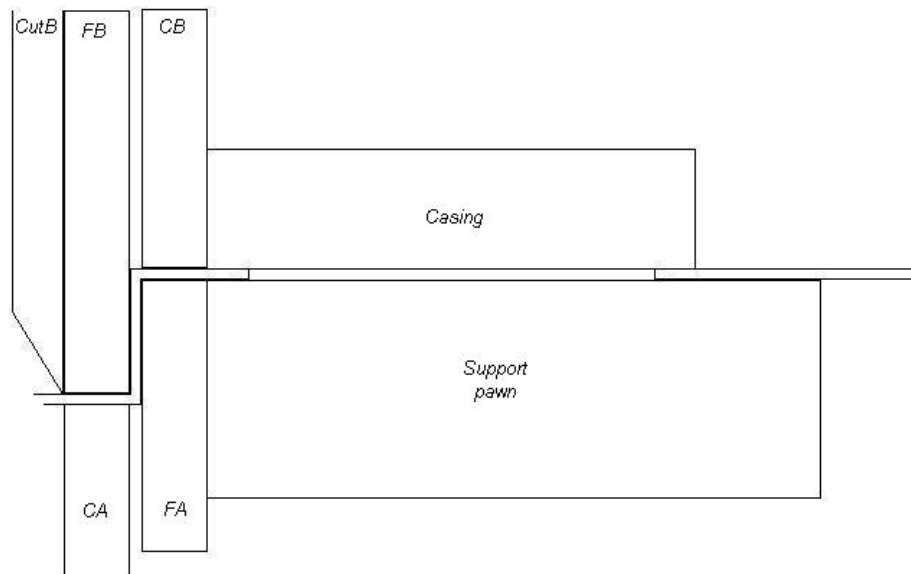
1st step: Gently pull down the lever so that at least the carriage blade (CB) lowers, without any pressure on the legs, for the component to butt against it



Then, the component is placed against the carriage blade and ready to be cambered



2nd step: Completely pull down the lever to proceed to the cambering



Legend:

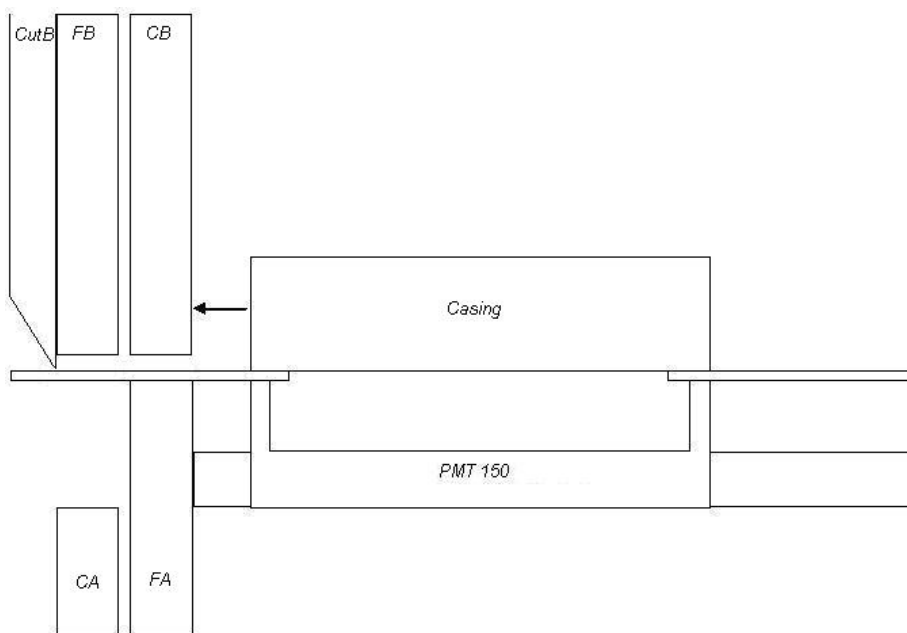
- CB** : Carriage blade
- FB** : Forming blade
- Cut B** : Cutting blade
- FA** : Forming anvil
- CA** : Cutting anvil

Use of the micrometric plate of translation (PMT 150)

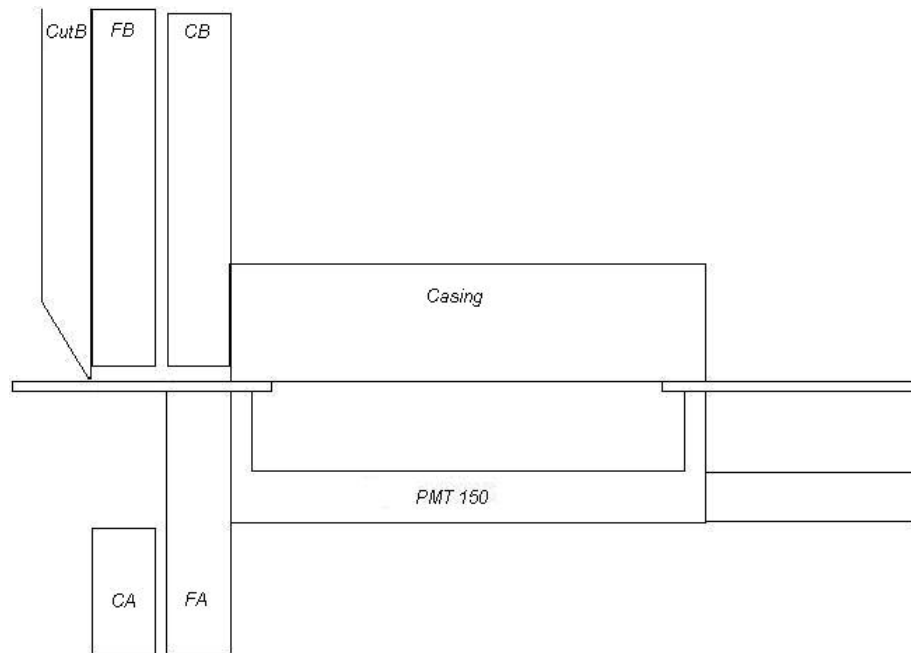
Contrary to the other cases of components (legs in the middle or on the top), the use of the micrometric plate of translation with a component whose legs are on the bottom will not lead to a change of the rib e. Indeed, this change is due to a small edge of the micrometric plate of translation on which the legs lie, but in this case, the casing does not lie on it, so the edge has not to be counted. It is the legs of the component which lie on it. Nevertheless, if we want to change the rib e, it is possible to add a wedge of the wished dimension between the component and the carriage blade (CB).

To camber this kind of component, you have to proceed in different steps.

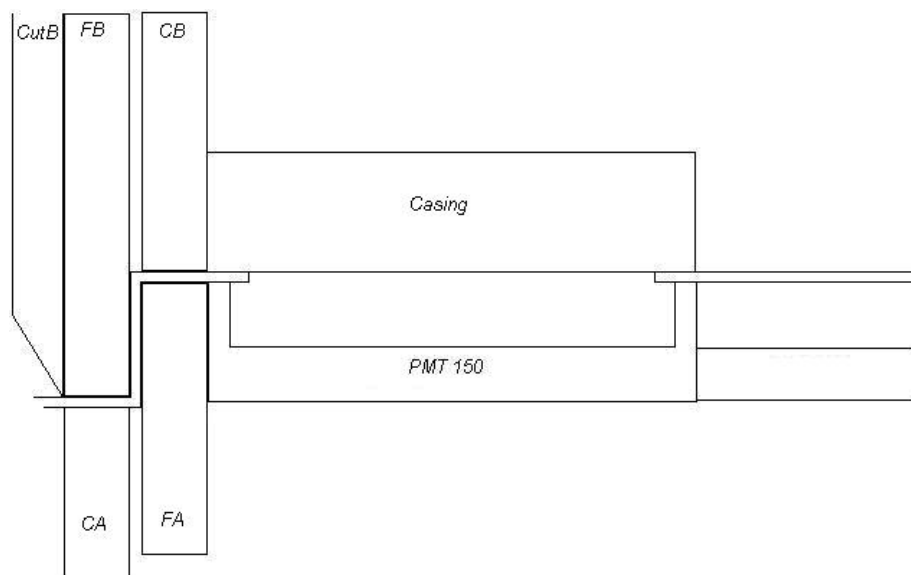
1st step: Gently pull down the lever so that at least the carriage blade (CB) lowers, without any pressure on the legs, for the component to butt against it



Then, the component is placed against the carriage blade and ready to be cambered



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Legend :

- CB** : Carriage blade
- FB** : Forming blade
- Cut B** : Cutting blade
- FA** : Forming anvil
- CA** : Cutting anvil

Blades change

Top part

Dismantling

Before everything, reset the blades to 0.

- 1) Unscrew the 4 screws located in front of the machine and take the face off
- 2) Screw the top screw of each dismantling jig on the springs-press
- 3) Square the bottom holes of the jigs with the holes on the forming support by toppling over the lever to the back. Once the screwing is done, the lever can be released.
- 4) Take off the two maintaining flanges by screwing off the 6 black screws, making out the left one and the right one
- 5) Hold the cutting blade and take off the whole set of the block. Make sure that the lever is leaning towards the back

If you have a blades replacement tape, change it, otherwise:

- 6) Unscrew the pressure selector (golden part) in order to reach the screw located below
- 7) Then, unscrew it, remove the springs, the forming blade and the carriage blade
- 8) Change the forming blade by screwing off the 2 screws behind the block



Step 1

Maintaining flanges



Step 2 & 3

Jigs



Step 3



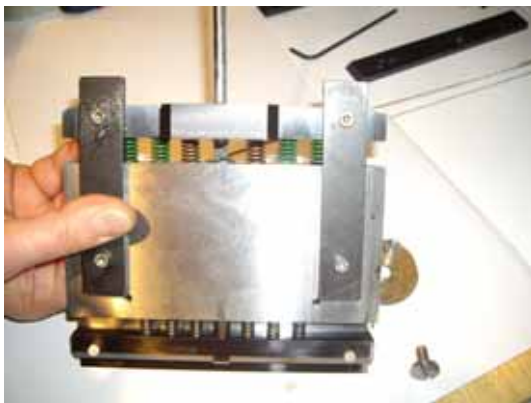
Step 4



Step 5



Step 6



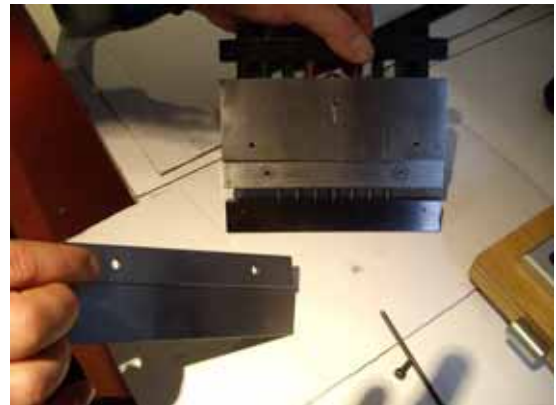
Step 7



Step 7



Step 8



Step 8

Reassembly

- 1) Put back the whole set by toying the lever so that the screws and the holes at the back square
- 2) Put back the 2 maintaining flanges by pushing the lever towards the back and then take off the jigs first added
- 3) Tighten the screws by manipulating the lever forward backward in order not to disturb the way down of the set tape/blade
- 4) Put back the front face



Step 1



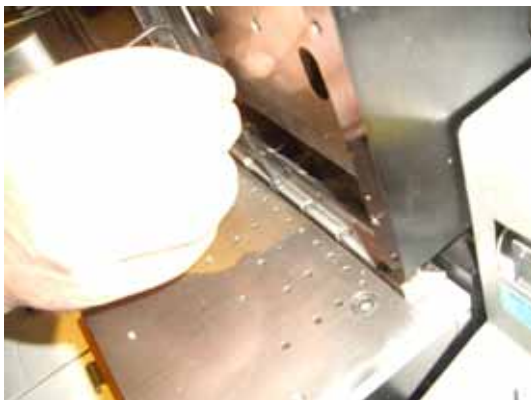
Step 2

Bottom part

To be noted : The change of the blades located on the bottom part of the machine has only to be done *in case of modification of the configuration of the cambering in the ribs e and f, and also in the case of a change of the radiuses of curvature.*

- 1) Take off the 6 screws of the forming anvil by proceeding in snail (5 3 1 2 4 6)
- 2) Remove the back face of the machine by unscrewing the 6 screws
- 3) Unscrew the 2 screws of the cutting anvil located at the extremities by the back of the machine, and the 4 located in the middle by the front
- 4) Take off the cutting anvil by the front and then, change the forming anvil and the cutting one
- 5) Put back in reverse order, taking care of the snail screwing

Caution ! : Check the tightening of the screws. It is eventually possible to make a first light tighten of the screws, and then another one to equilibrate the strengths.



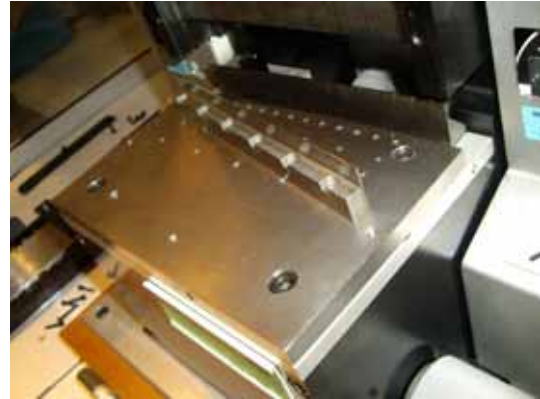
Step 1



Step 2

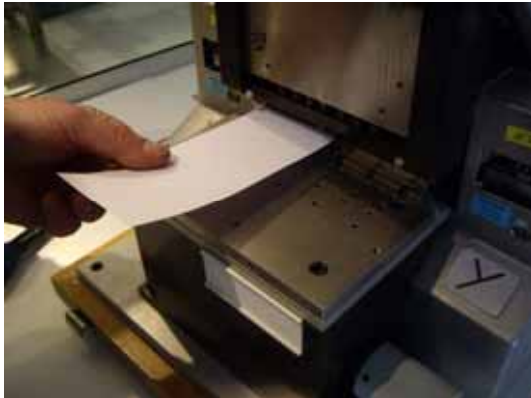


Step 3



Step 4

After having changed the blades and anvils, with a sheet of paper, proceed to a cut on the left and on the right of the blade, in order to check the setting of the blades, i.e. if nothing has moved.



If the cut is done correctly on all the length of the sheet, the cambering machine is ready to be used with the new set of blades.

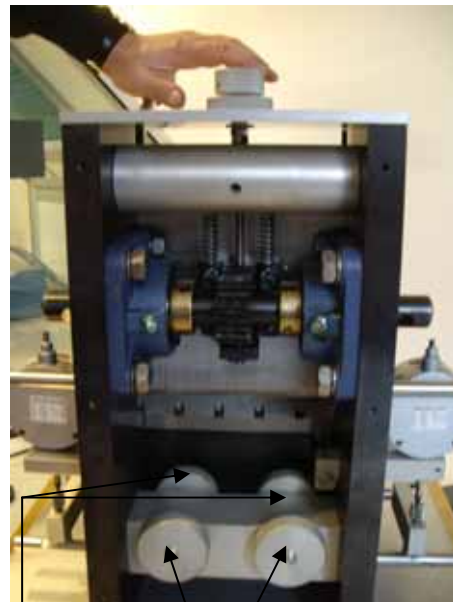
If you notice that the cut is not done correctly on all the length, you have to proceed to the setting of the cutting blade.

Setting of the cutting blade

- 1) Take off the lateral fairings in order to reach the 4 screws located on the base of the machine (a)
- 2) Release them of about 1/4 turn and come by the back of the machine
- 3) Release the 2 knurls of the back (1)
- 4) Make the cutting blade come down thanks to the lever
- 5) With the 2 other knurls (located more inside the machine) (2), make the cutting blade butt against the forming anvil
- 6) Realize a cut test
- 7) If the cut is done on all the length of the sheet of paper, tighten the knurls of the back (otherwise step 5 has not been realized properly)
- 8) Put back the front face
- 9) Completely tighten the 4 screws on the base of the machine, put back the lateral fairings and also the back face



(a)



(2)

(1)

Options

Micrometric plate of translation PMT 150

The micrometric plate of translation is a tool which allows to make the rib e vary. As the edge of this tool is 0,5mm wide, its use will add to the rib e defined by the blade width 0,5mm without any intermediate possibility, and this until 16mm.

Mounting of the PMT 150

- 1) Release the 2 screws on the PMT 150. Then, the micrometric plate of translation is in two parts.
- 2) Screw the bottom part of the PMT 150 to the cambering machine, without tightening the screws.
- 3) Settle the ruler to 15mm on position 0
- 4) Put back the 2 screws of the PMT 150, first without tightening them, and then make the PMT 150 butt against the blade thanks to the hand. Once this is done, properly tighten the screws.
- 5) Tighten the screws of the bottom part always by holding with the hand so that the 2 parts are flattened correctly

The micrometric plate of translation is ready to be used.

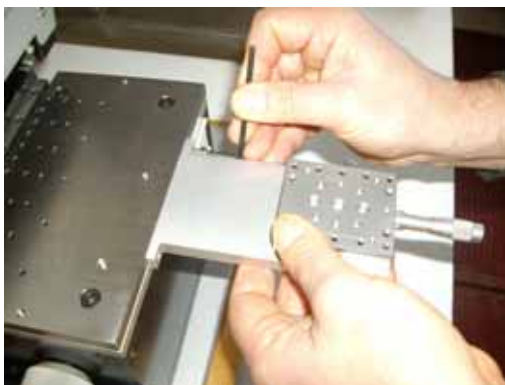
To be noted : The setting of the PMT 150 has only to be done the first time it is mounted.



Step 1



Step 1



Step 2



Step 3



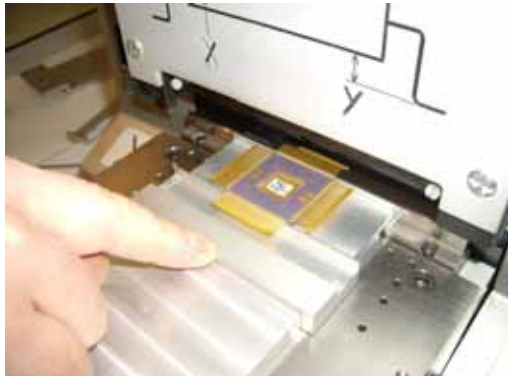
Step 4



Machine mounted with PMT 150

Use of the micrometric plate of translation

- 1) Place the component on the PMT 150 by making the casing butt against the edges of it
- 2) Make the component move back of the wished dimension thanks to the ruler by turning it clockwise (the dimension of the ruler will be added to the basic dimension of e, and 1 grading = 2/100 mm)



Step 1



Step 2

To be noted : Contrary to the classical cambering, in the case of the use of a micrometric plate of translation, the legs lie directly on the blade and we do not take into consideration the dimension X any more. So, the setting will only be done on Y.

Blades replacement tape

The blades replacement tape is tool composed of the whole block springs-press, jigs and a set of blades. It was designed to make easier the change of the blades for the operator. Indeed, it allows to avoid the complete dismantling of the block to change the blades. It is very practical and very useful in case of regular change of the blades.

When changing the blades of the machine, you will only have to change the whole block, so to replace the first tape by the second one.

The change of the blades of the machine thanks to a blades replacement tape will have to be done in the following way :

- 1) Remove the 4 screws located on the front of the machine and take off the front face
- 2) Screw the top part of each jig on the springs-press
- 3) Square the bottom holes of the jigs with the holes on the forming support by toppling over the lever to the back. Once the screwing is done, the lever can be released.
- 4) Take off the two maintaining flanges by screwing off the 6 black screws, making out the left one and the right one
- 5) Hold the cutting blade and take off the whole set of the block. Make sure that the lever is leaning towards the back
- 6) Mount the new blades replacement tape by toying the lever so that the screws and the holes at the back square
- 7) Put back the two maintaining flanges by pushing the lever towards back and take off the jigs first added
- 8) Tighten the screws by manipulating the lever forward backward in order not to disturb the way down of the set tape/blade
- 9) Put back the front face



Step 1



Step 2 & 3



Step 3



Step 4



Step 5



Step 6

Recommendations

- Before each cambering, check-out the blades property and their leveling
- After each cambering, clean the blades and reset the comparators to 0
- In case of batteries exchange, check the zero setting of the blades
- To exchange the comparators batteries, consult the comparators guide enclosed
- Do not touch the blades to avoid any risk of oxidizing



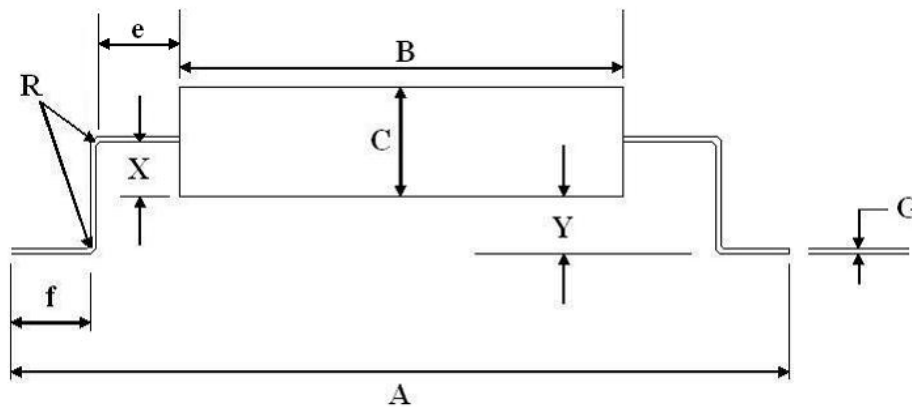
Blades choice and abilities of the cambering machine

The choice of the blades of the machine is essential as it is them which will define the ribs of the cambering. Indeed, the ribs correspond to the blades thickness.

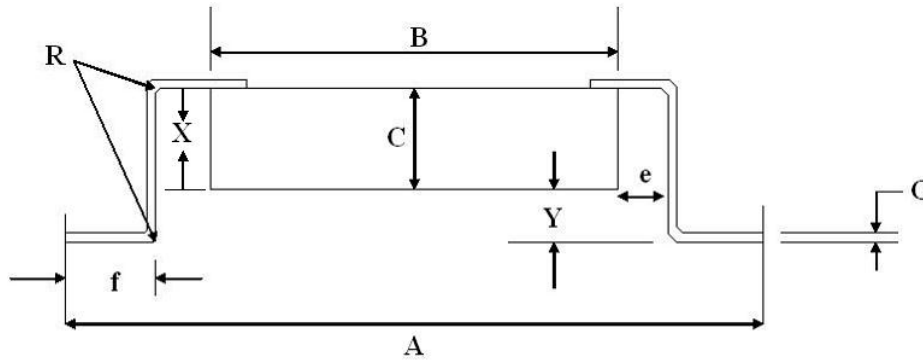
As each cambering is specific, the configuration of the blades is different from one machine to another. So, the blades have to be chosen in function of the dimensions needed for the cambering.

3 different kinds of components exist, presented below with the ribs used for the cambering:

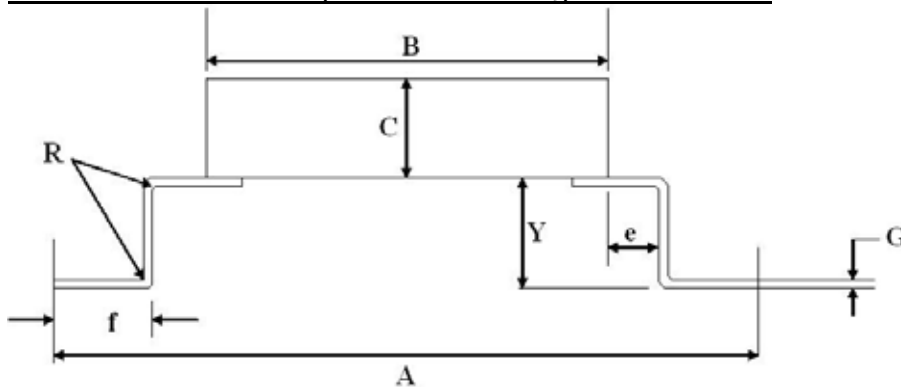
Case of a component with the legs in the middle of it



Case of a component with the legs on the top of it



Particular case of a component with the legs on the bottom



Ribs description

A: The rib A corresponds to the total length of the component after cambering, legs included. It will be determined by the length of the component and by the ribs e and f, themselves determined by the blades.

B: Length of the component

C: Width of the component

e: The rib e is determined by the thickness of the first blade. It can be increased by adding a micrometric plate of translation (ref. PMT 150).

f: In the case of the legs are cut by the machine after cambering, the rib f is determined by the thickness of the second blade. In the contrary case, it is the operator who determines this rib and cut the legs manually (by stopping the cutting system on the machine).

R: Radius of curvature

G: Thickness of the legs of the component

X: Distance between the legs of the component and the bottom of the case

Y: The rib Y corresponds to the extra height of the component in comparison with the printed circuit board

The board below presents the maximum and minimum dimensions possible on the machine:

<u>Designation</u>	<u>Minimum dimension (en mm)</u>	<u>Maximum dimension (en mm)</u>
A	/	/
B	/	149
C	1	15
e*	0,6	2,5
f	0,6	/
R	0,3	0,6
G	0,15 or 0,35	0,35 or 0,60
X	0	15
Y	0	15

* The use of a micrometric plate of translation (ref. PMT 150) allows to make the rib e vary from the configuration of the machine + 0,5 mm until a maximum of 16 mm. For example, with a machine planned for $e = 0,6$ mm, you will have to count $0,6 + 0,5 = 1,1$ mm

There are 2 different ways of measuring the ribs for cambering. The first one includes the legs in the measure of the rib, the other one not. So, this is an important element to be precised when ordering the machine.

