MAGNABEND™

ELECTROMAGNETIC SHEETMETAL FOLDERS

MAGNABEND - USER MANUAL for MODELS 650E, 1000E & 1250E

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MAGNABEND - INTRODUCTION

The Magnabend sheetmetal bending machine is a highly versatile and easy to use machine for bending all types of sheetmetal such as aluminium, copper, steel, and stainless steel.

The electromagnetic clamping system provides more freedom to form the workpiece into complex shapes. It is easy to form very deep narrow channels, closed sections, and deep boxes that are difficult or impossible on a conventional machine.

The unique hinging system used for the bending beam provides a completely open-ended machine thus greatly extending its versatility. The single column stand design also contributes to the versatility of the machine by providing a "free-arm" effect at the ends of the machine.

Ease of use flows from the fingertip control of the clamping and unclamping, the ease and accuracy of bend alignment, and the automatic adjustment for sheetmetal thickness.

A two-handed interlock provides safety for the operator.

Fundamentally the use of magnetic clamping means that bending loads are taken right at the point where they are generated; forces do not have to be transferred to support structures at the ends of the machine. This in turn means that the clamping member does not need any structural bulk and hence can be made much more compact and less hindering. (The thickness of the clampbar is determined only by its requirement to carry sufficient magnetic flux and not by structural considerations at all).

Special centerless compound hinges have been developed especially for the Magnabend, and are distributed along the length of the bending beam and thus, like the clampbar, take bending loads close to where they are generated.

The combined effect of the magnetic clamping with the special centerless hinges means that the Magnabend is a very compact, space saving, machine with a very high strength-to-weight ratio.

To get the most out of your machine, please read this manual, particularly the section titled USING THE MAGNABEND. Please also return the WARRANTY REGISTRATION as this will simplify any claims under warranty and also it gives the manufacturer a record of your address which facilitates keeping customers informed of any developments which may benefit them.

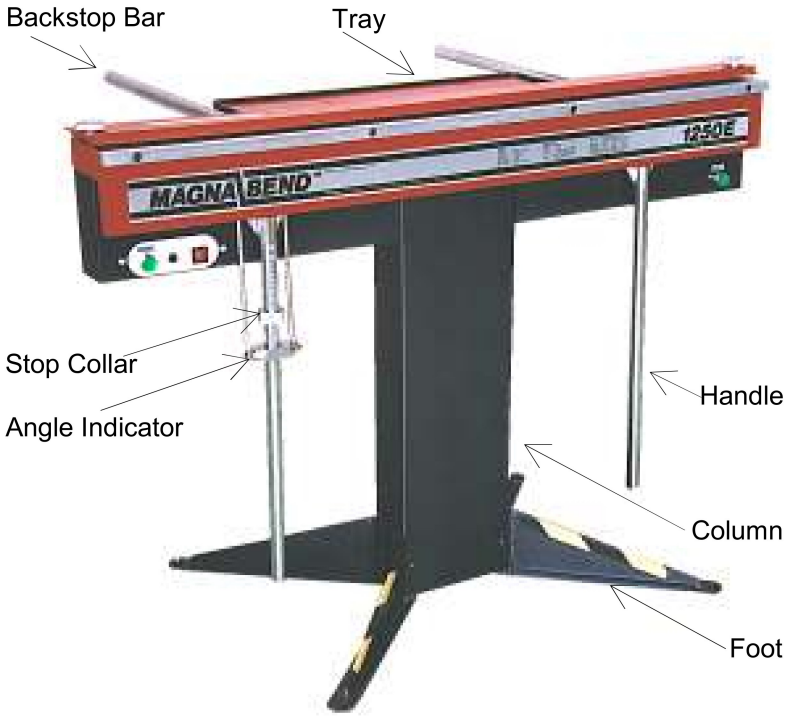
ASSEMBLY INSTRUCTIONS

1. Unpack the column and the feet and locate the packet of fasteners and the 6 mm Allen key.
2. Attach the feet to the column. The pair of feet with the black and yellow safety tape should point forwards from the column. (The front face of the column is the side without a join in it.)
   Use M10 x 16 button head screws to attach the feet.
3. Models 650E and 1000E: Attach the footplate under the tips of the front feet. Use two M10 x 16 cap-head screws with washers. Alignment of the screw holes will be made easier if the foot mounting screws are left loose until after the footplate is fitted. The M8 x 20 cap-head screws in the rear feet may be adjusted to level the machine and suit any unevenness in the floor.
   Model 1250E: A footplate is not supplied with this machine; it must be bolted to the floor at the front feet.
4. With the aid of an assistant carefully place the Magnabend machine on the stand and secure it with M8 x 16 cap-head screws.
   Models 650E & 1000E: Be sure to guide the wires and connector down into the column as the machine is being lowered onto the stand.
5. Models 650E & 1000E: Remove the rear electrical access panel and plug-together the 3-pin connector. This connects the electromagnet in the body of the machine to the electrical unit in the column. Replace the panel.
   Model 1250E: Fasten the mains-cable clip to the back of the column with an M6 x 10 pan-head screw.
6. Model 650E: Join the two halves of the tray using M6 pan-head screws and nuts. Attach the tray (with rubber mat) to the rear of the machine using two M8 x 12 cap-head screws. Fit two backstop slides to the sides of the tray.
   Models 1000E and 1250E: Attach the two backstop bars into the back of the machine using two M8 x 16 screws for each bar. Attach the tray (with rubber mat) to the rear of the machine using three M8 x 16 cap-head screws. Fit a stop collar onto each backstop bar.
7. Attach the handle(s) with M8 x 16 cap-head screws.
   Models 650E and 1000E: The handle should be slipped down through the angle indicating ring before attaching the handle.
   Model 1250E: The handle with the angle scale must be fitted on the left side, and a stop collar slipped onto it and clamped up near the top of the handle.

8. Model 1250E: Swing the bending beam up through 180°. Unpack the an-

gle indicator assembly and pass the Indicator Slide over the left handle. Unscrew the two M8 cap-head screws from the indicator anchor-block which is fastened to the base of the machine near the left handle. Attach the Indicator Arms to the anchor-block and tighten both M8 cap-head screws by hand and then, using the 6 mm Allen key, tighten both screws very firmly.
Note: The machine may not turn ON if these screws are not tight.

9. Using a chlorinated solvent (or petrol) clean off the clear wax-like coating from the working surfaces of the machine.
10. Place the short clamp bars in the tray and the full-length clamp bar on top of the machine with its locating balls sitting in the grooves in the top surface of the machine.
11. Plug into a power outlet and turn ON the main switch. The machine is now ready for operation - please refer to "BASIC OPERATION" in this manual.



SPECIFICATIONS ...

NOMINAL CAPACITY			Machine Weight
Model 650E:	625 mm x 1.6 mm	(2ft x 16g)	72 kg
Model 1000E:	1000 mm x 1.6 mm	(3ft x 16g)	110 kg
Model 1250E:	1250 mm x 1.6 mm	(4ft x 16g)	150 kg

CLAMPING FORCE

Total force with standard full-length clamp-bar:

Model 650E: 3 Tonne
Model 1000E: 4.5 Tonne
Model 1250E: 6 Tonne

ELECTRICAL

1 Phase, 220/240 V AC

Current:

Model 650E: 4 Amp
Model 1000E: 6 Amp
Model 1250E: 8 Amp

Duty Cycle: 30%

Protection: Thermal cut-out, 70°C

Control: Start button ...pre-clamping force

Bending beam microswitch...full clamping

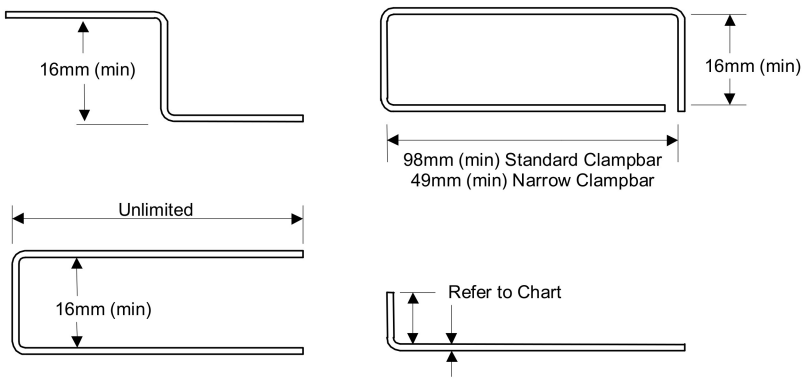
Interlock...the start button and the bending beam must be operated in correct overlapping sequence to initiate full-clamping force.

HINGES

Special centerless design to provide a completely open-ended machine.

Rotation angle: 180°

BENDING DIMENSIONS



... SPECIFICATIONS ...

BENDING CAPABILITY

(When using a standard full-length clamp-bar to bend a full-length work-piece)

MATERIAL (yield/ultimate stress)	THICKNESS	LIP WIDTH (minimum)	BEND RADIUS (typical)
Mild-steel (250/320 MPa)	1.6 mm	30 mm*	3.5 mm
	1.2 mm	15 mm	2.2 mm
	1.0 mm	10 mm	1.5 mm
Aluminium Grade 5005 H34 (140/160 MPa)	1.6 mm	30 mm*	1.8 mm
	1.2 mm	15 mm	1.2 mm
	1.0 mm	10 mm	1.0 mm
Stainless Steel Grades 304, 316 (210/600 MPa)	1.0 mm	30 mm*	3.5 mm
	0.9 mm	15 mm	3.0 mm
	0.8 mm	10 mm	1.8 mm

* With extension bar fitted to bending beam.

SHORT CLAMP-BAR SET

Lengths: Model 650E: 25, 38, 52, 70, 140, 280 mm
Models 1000E & 1250E: 25, 38, 52, 70, 140, 280, 597 mm

All sizes (except 597 mm) may be plugged together to form a bending edge within 25 mm of any desired length up to 575 mm.

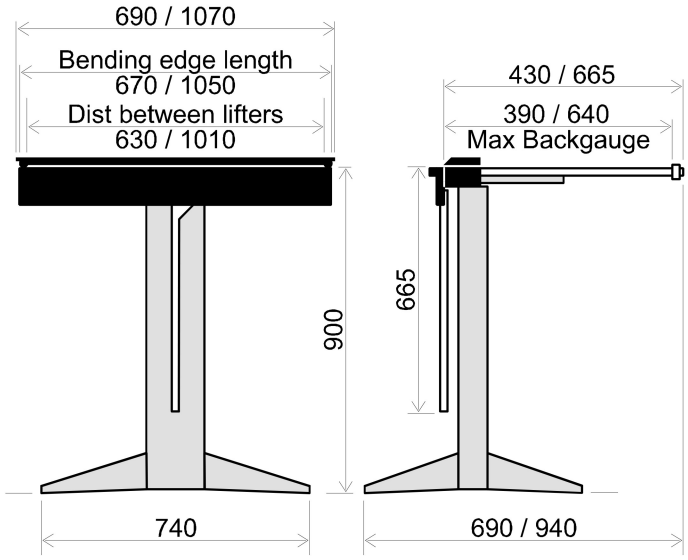
SLOTTED CLAMPBAR

When supplied, a special set of 8 mm wide slots provide for forming all tray sizes in the range shown below:

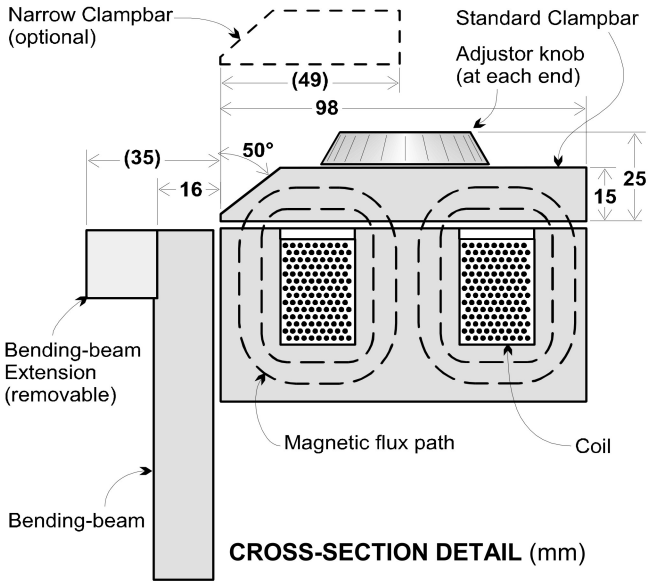
* For deeper trays use the Short Clamp-bar set.

MODEL	TRAY LENGTHS	MAX. TRAY DEPTH
650E	15 to 635 mm	40 mm*
1000E	15 to 1015 mm	40 mm*
1250E	15 to 1265 mm	40 mm*

MODELS 650E / 1000E



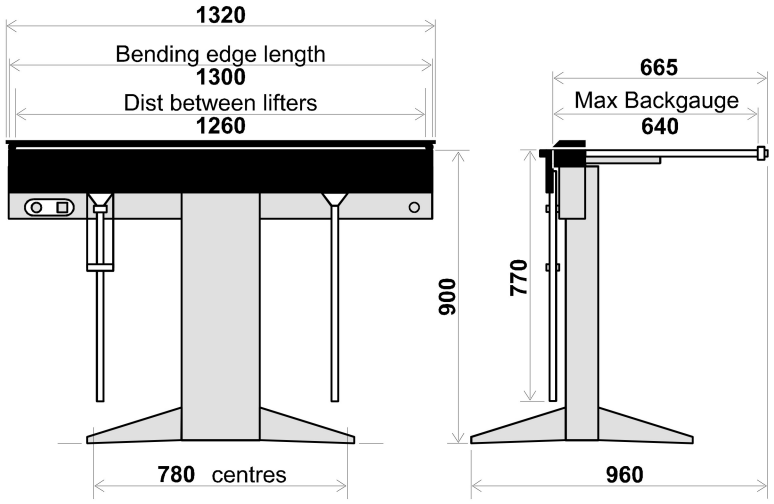
FRONT & SIDE ELEVATIONS (mm)



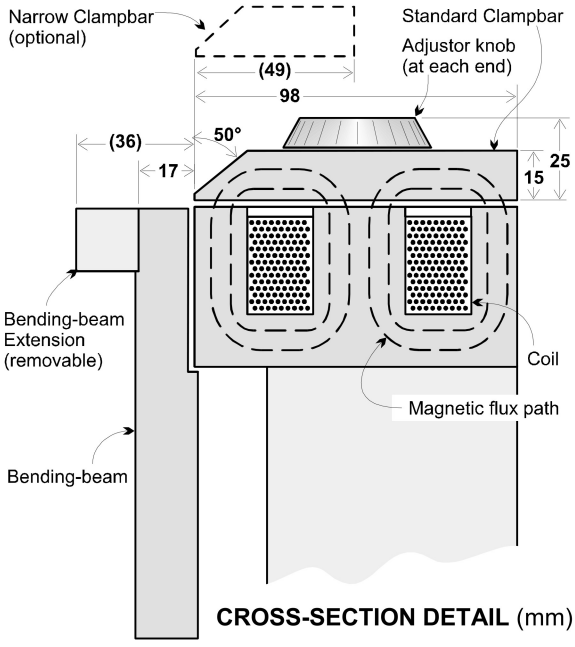
CROSS-SECTION DETAIL (mm)

... SPECIFICATIONS

MODEL 1250E



FRONT & SIDE ELEVATIONS (mm)



CROSS-SECTION DETAIL (mm)

INSPECTION SHEET ...

MODEL [ ] **SERIAL NO.** [ ] **DATE** [ ]

EARTHING CONNECTIONS

Measure resistance from mains plug earth pin to magnet body .... [ ] ohm

ELECTRICAL ISOLATION

Megger from coil to magnet body ..... [ ]

MIN/MAX SUPPLY VOLTAGE TESTS

At 260v: Pre-clamp.... full-clamp.... release ..... [ ]

At 200v: Pre-clamp.... release ..... [ ]

Pre-clamp.... full-clamp.... release ..... [ ]

INTERLOCK SEQUENCE

With power on, pull HANDLE, then press START button.
Check that machine does NOT activate ..... [ ]

TURN-ON/OFF ANGLES

Movement of Bending Beam to activate full-clamping, measured at bottom of bending beam. (4 mm to 6 mm) ..... [ ] mm

Reverse motion to switch-off machine. Measure back from 90°. (Should be within the range 15° $\pm$ 5°)..... [ ] deg

ANGLE SCALE

Reading at edge of Indicator when bending beam is set to 90° with an engineer's square. (min 89° , max 91°)..... [ ] deg

MAGNET BODY

Straightness of top surface, along front pole (max deviation = 0.5 mm) ..... [ ] mm

Flatness of top surface, across the poles (max deviation = 0.1 mm) ..... [ ] mm

BENDING BEAM

Straightness of working surface (max deviation =0.25 mm) ..... [ ] mm

Alignment of extension bar (max deviation = 0.25 mm)..... [ ] mm

[**Note**: Test straightness with precision straight-edge.]

... INSPECTION SHEET

MAIN CLAMPBAR

Straightness of bending-edge (max deviation = 0.25 mm) ..... ☐ mm

Height of lift (with lifting balls in grooves) (min 3 mm) ..... ☐ mm

Can lifting balls be compressed flush with surface?..... ☐

With adjusters set at "1" and the bending beam at 90°
is the bending-edge parallel to, and 1 mm from, the beam? ..... ☐
With the bending beam at 90°, can the clampbar be adjusted
forward to touch and rearward by 2 mm? ..... ☐

HINGES

Check for lubrication on shafts . ☐ and sector blocks..... ☐

Check that hinges rotate through 180° freely and smoothly..... ☐

Check hinge **pins** do **not** rotate . ☐ and are loctited ..... ☐

Have the retaining screw nuts been locked? ..... ☐

BENDING TEST

(A maximum specification bend to 90°, at minimum supply voltage.)

Steel test piece thickness..... ☐ mm, Bend length..... ☐ mm

Width of lip..... ☐ mm, Bend radius ..... ☐ mm

Uniformity of bend angle (maximum deviation = 2°)..... ☐ deg

LABELS

Check for clarity, adhesion to machine and proper alignment.

Nameplate & Serial No..... ☐ Clampbar Warning ..... ☐

Electrical warnings ..... ☐ Switch labelling ..... ☐

Safety tape on front legs..... ☐

FINISH

Check cleanliness, freedom from rust, blemishes etc. ..... ☐

SIGNATURES

Assembled & Tested . ☐

Q. A. Inspection ..... ☐

BASIC OPERATION

WARNING

The Magnabend sheetmetal folder can exert a total clamping force of several tonnes (see SPECIFICATIONS). It is equipped with a two-handed interlock to help ensure that fingers cannot be inadvertently caught under the clampbar when electro-magnetic clamping is applied.

However, **it is most important that only one operator use the machine at a time**. It is potentially dangerous for one person to insert the workpiece and handle the clampbars while another person operates the switches !

NORMAL BENDING

Ensure power is ON at the power outlet and the full-length clampbar is positioned on the machine with its lifting balls resting in the locating grooves at each end.

1. **Adjust for workpiece thickness** by rotating the eccentric adjusters at either end of the clampbar. Lift the bending beam up to the 90° position and check that it is parallel to the edge of the clampbar - if necessary readjust the eccentric lifters.
   (For optimum results the gap between the clampbar edge and the surface of the bending beam should be set to slightly greater than the metal thickness to be bent.)
2. **Insert the workpiece** then tilt the front edge of the clampbar down and align the bend line to the bending edge.
3. **Press and hold the START button**. This applies pre-clamping.
4. **With the other hand pull on the handle**. Full clamping is now automatically applied and the START button should now be released. Continue bending until the required angle is reached.
5. The bending beam may be reversed about 10° to 15° to take pressure off the workpiece for checking the bend angle. Reversing by more than 15° automatically turns the machine off and releases the workpiece.

CAUTION

- To avoid the risk of damaging the bending edge of the clampbar or of denting the top surface of the magnet body, **do not put small objects under the clampbar.** The recommended minimum bend length using the standard clampbar is 15 mm, except when the workpiece is very thin or soft.
- The clamping force of the magnet is less when it is hot. Therefore to get the best performance **apply clamping for no longer than is necessary** to do the bend.

POWER SHEAR (Optional accessory)

INSTRUCTIONS FOR USE

The power shear (based on the Makita Model JS 1660) provides a means for cutting sheetmetal in such a way that very little distortion is left in the workpiece. This is possible because the shear removes a waste strip, about 4 mm wide, and most of the distortion inherent in shearing sheetmetal goes into this waste strip. For use with a Magnabend the shear has been fitted with a special magnetic guide.

The shear works well in combination with a Magnabend Sheetmetal Folder; the Magnabend provides both a means of holding the workpiece fixed while being cut and also a means for guiding the tool so that very straight cutting is possible. Cuts of any length can be handled in steel up to 1.6 mm thick or aluminium up to 2 mm thick.

To use the tool first place the sheetmetal workpiece under the clampbar of the Magnabend and position it so that the cutting line is exactly 1 mm in front of the edge of the Bending Beam.

A toggle switch labelled "NORMAL / AUX CLAMP" will be found next to the main ON/OFF switch. Switch this to the AUX CLAMP position to hold the workpiece firmly in position.

Position the shear at the right-hand end of the Magnabend and ensure that the magnetic guide attachment engages on the front edge of the Bending Beam. Start the power shear and then push it evenly along until the cut is completed.

Notes:

1. For optimum performance the blade clearance should be adjusted to suit the thickness of material to be cut. Please read the Makita instructions supplied with the JS1660 shear.
2. If the Shear does not cut freely check that the blades are sharp.

MAKITA POWER SHEAR IN ACTION

Note that the waste strip curls out in a continuous spiral leaving your workpiece distortion-free.

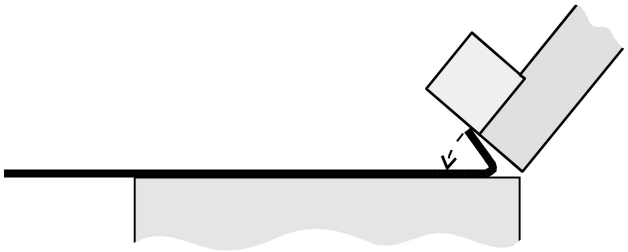


FOLDING A LIP (HEM)

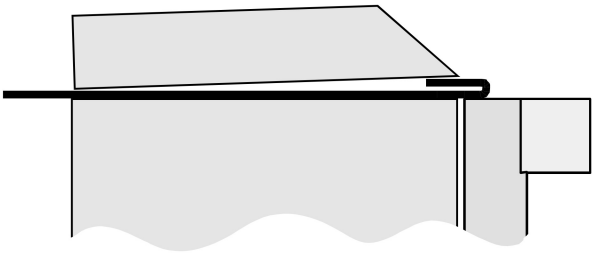
The technique used for folding lips depends on the workpiece thickness and to some extent, on its length and breadth.

Thin Workpieces (up to 0.8 mm)

1. Proceed as for normal bending but continue the bend as far as possible (135°).
2. Remove the clampbar and leave the workpiece on the machine but move it rearwards about 10 mm. Now swing the bending beam over to compress the lip. (Clamping need not be applied). [Note: Do not attempt to form narrow lips on thick workpieces].



3. With thin workpieces, and/or where the lip is not too narrow, a more complete flattening can be achieved by following with magnetic clamping only:

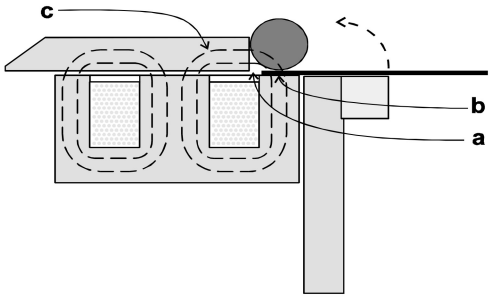


ROLLED EDGE

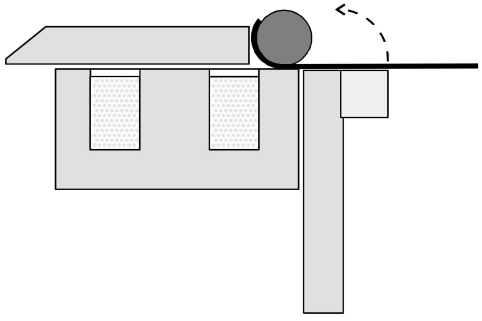
FORMING A ROLLED EDGE

Rolled edges are formed by wrapping the workpiece around a round steel bar or piece of thick-walled pipe.

1. Position the workpiece, clampbar and rolling bar as shown.
   a) Ensure that the clampbar does not overlap the front pole of the machine at “a” as this would allow magnetic flux to bypass the rolling bar and hence clamping would be very weak.
   b) Make sure the rolling bar is resting on the steel front pole of the machine (“b”) and not further back on the aluminium part of the surface.
   c) The purpose of the clampbar is to provide a magnetic pathway (“c”) into the rolling bar.
2. Wrap the workpiece as far as possible then re-position as shown.



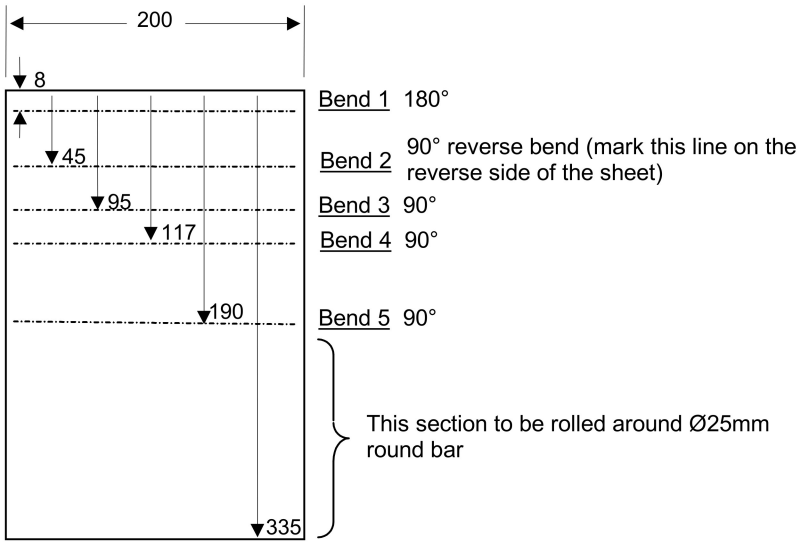
3. Repeat step 2 as required.



INSTRUCTIONS FOR FORMING TEST PIECE

In order to gain familiarity with your machine and the type of operations that can be performed with it, it is recommended that a test-piece be formed as described below:

1. Select a piece of 0.8 mm thick mild steel or aluminium sheet and cut it to 335 x 200 mm.
2. Mark lines on the sheet as shown below:



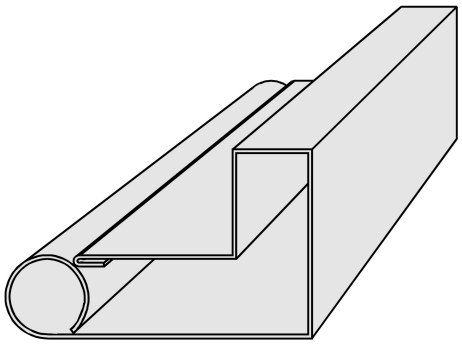
3. Align Bend 1 and form a lip on the edge of the workpiece. (See "FOLDED LIP")
4. Turn the test piece over and slide it under the clampbar, leaving the folded edge towards you. Tilt the clampbar forward and line up Bend 2. Make this bend to 90°. The test piece should now look like this:



... TEST PIECE

5. Turn test piece over and make Bend 3, Bend 4 and Bend 5 each to 90°
6. To complete the shape, the remaining piece is to be rolled around a 25 mm diameter round bar of steel.
   - Select the 280 mm clamp-bar and place it, the test piece and the round bar on the machine as shown under “ROLLED EDGE” earlier in this manual.
   - Hold the round bar in position with the right hand and apply pre-clamping by pressing and holding the START button with the left hand. Now use your right hand to pull the handle as if doing an ordinary bend (the START button may be released). Wrap the workpiece as far as possible (about 90°). Reposition the workpiece (as shown under “Forming a Rolled Edge”) and wrap again. Continue until the roll is closed.

The test shape is now complete.

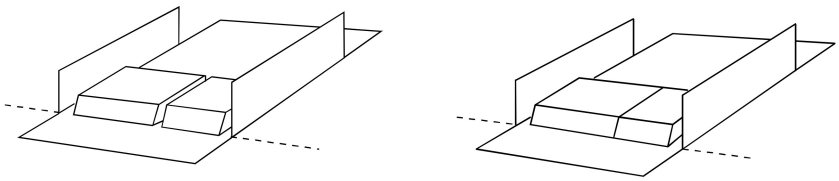


MAKING BOXES (USING SHORT CLAMPBARS)

There are numerous ways of laying-out boxes and numerous ways of folding them up. The MAGNABEND is ideally suited to forming boxes, especially complex ones, because of the versatility of using short clampbars to form folds relatively unhindered by previous folds.

Plain Boxes

1. Make the first two bends using the long clampbar as for normal bending.
2. Select one or more of the shorter clampbars and position as shown. (It is not necessary to make up the exact length as the bend will carry over gaps of at least 20 mm between the clampbars.)



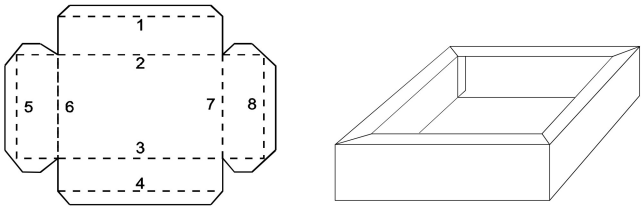
For bends up to 70 mm long, just select the largest clamp piece that will fit. For longer lengths it may be necessary to use several clamp pieces. Just select the longest clampbar that will fit in, then the longest that will fit in the remaining gap, and possibly a third one, thus making up the required length.

For repetitive bending the clamp pieces may be plugged together to make a single unit with the required length. Alternatively, if the boxes have shallow sides and you have available a slotted clampbar, then it may be quicker to make the boxes in the same manner as shallow trays. (See next section: TRAYS)

Lipped boxes

Lipped boxes can be made using the standard set of short clampbars provided one of the dimensions is greater than the width of the clampbar (98 mm).

1. Using the full-length clampbar, form the length wise folds 1, 2, 3, &4.
2. Select a short clampbar (or possibly two or three plugged together) with a length at least a lip-width shorter than the width of the box (so that it may later be removed). Form folds 5, 6, 7 & 8. While forming the folds 6 & 7, be careful to guide the corner tabs either inside or outside the sides of the box, as desired.



Boxes with separate ends

A box made with separate ends has several advantages:

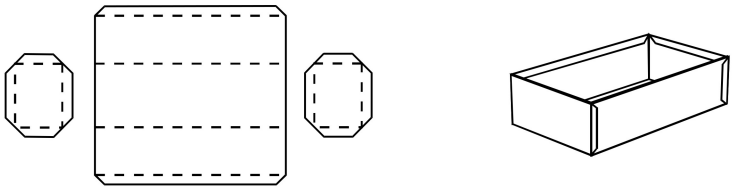
- it saves material if the box has deep sides,
- it does not require corner notching,
- all cutting-out can be done with a guillotine,
- all folding can be done with a plain full-length clampbar;

and some drawbacks:

- more folds must be formed,
- more corners must be joined, and
- more metal edges and fasteners show on the finished box.

Making this kind of box is straight forward and the full-length clampbar can be used for all folds.

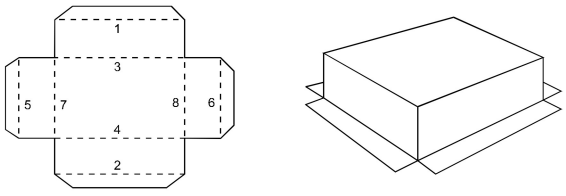
1. Prepare the blanks as shown below.
2. First form the four folds in the main workpiece.
3. Next, form the 4 flanges on each end piece. For each of these folds, insert the narrow flange of the end piece under the clampbar.
4. Join the box together.



Flanged boxes with plain corners

Plain cornered boxes with outside flanges are easy to make if the length and width are greater than the clampbar width of 98 mm. Forming boxes with outside flanges is related to making TOP-HAT SECTIONS (described in a later section - see Contents).

4. Prepare the blank.
5. Using the full-length clampbar, form folds 1, 2, 3 & 4.
6. Insert the flange under the clampbar to form fold 5, and then fold 6.
7. Using appropriate short clampbars, complete folds 7 & 8.

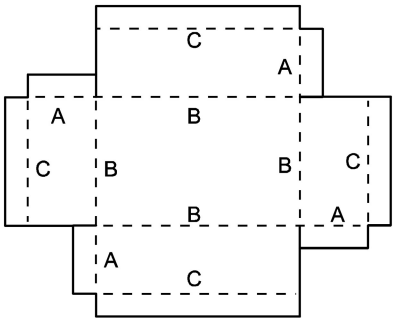


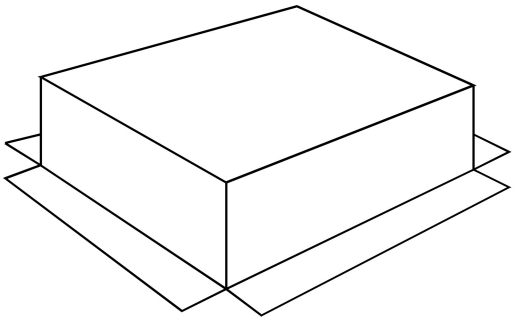
Flanged Box with Corner Tabs

When making an outside flanged box with corner tabs and without using separate end pieces, it is important to form the folds in the correct sequence.

1. Prepare the blank with corner tabs arranged as shown.
2. At one end of the full-length clampbar, form all tab folds "A" to 90. It is best to do this by inserting the tab under the clampbar.
3. At the same end of the full-length clampbar, form folds "B" to 45° only. Do this by inserting the side of the box, rather than the bottom of the box, under the clampbar.
4. At the other end of the full-length clampbar, form the flange folds "C" to 90°.
5. Using appropriate short clampbars, complete folds "B" to 90.
6. Join the corners.

Remember that for deep boxes it may be better to make the box with separate end pieces.





FORMING TRAYS (USING SLOTTED CLAMPBAR)

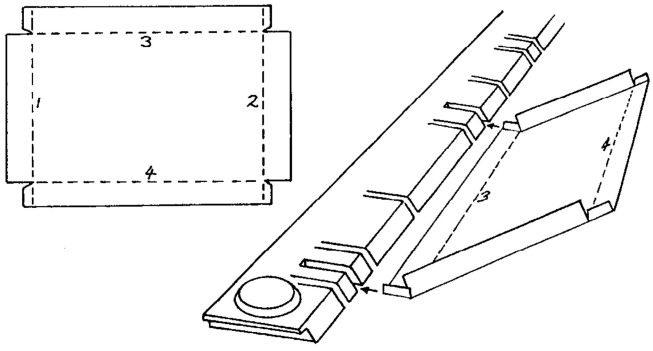
The Slotted Clampbar, when supplied, is ideal for making shallow trays and pans quickly and accurately. The advantages of the slotted clampbar over the set of short clampbars for making trays are that the bending edge is automatically aligned to the rest of the machine, and the clampbar automatically lifts to facilitate the insertion or removal of the workpiece. Never-the-less, the short clampbars can be used to form trays of unlimited depth, and of course, are better for making complex shapes.

In use, the slots are equivalent to gaps left between the fingers of a conventional box & pan folding machine. The width of the slots is such that any two slots will fit trays over a size range of 10 mm, and the number and locations of the slots are such that for all sizes of tray, there can always be found two slots that will fit it. (The shortest and longest tray sizes the slotted clampbar will accommodate are listed under SPECIFICATIONS.)

To fold up a shallow tray:

1. Fold-up the first two opposite sides and the corner tabs using the slotted clampbar but ignoring the presence of the slots. These slots will not have any discernible effect on the finished folds.
2. Now select two slots between which to fold-up the remaining two sides. This is actually very easy and surprisingly quick. Just line-up the left side of the partly made tray with the leftmost slot and see if there is a slot for the right side to push into; if not, slide the tray along till the left side is at the next slot and try again. Typically, it takes about 4 such tries to find two suitable slots.
3. Finally, with the edge of the tray under the clampbar and between the two chosen slots, fold up the remaining sides. The previously formed sides go into the selected slots as the final folds are completed.

With tray lengths that are nearly as long as the clampbar it may be necessary to use one end of the clampbar in lieu of a slot.



BACKSTOPS

USING THE BACKSTOPS

The backstops are useful when a large number of bends have to be made all of which are the same distance from the edge of the workpiece. Once the backstops are correctly set any number of bends can be made without the need for any measuring or marking out on the workpiece.

Normally the backstops would be used with a bar laid against them so as to form a long surface on which to reference the edge of the workpiece. No special bar is supplied but the extension piece from the bending beam may be used if another suitable bar is not available.

NOTE: If it is required to set a backstop under the clampbar, then this can be done by using a strip of sheetmetal the same thickness as the workpiece, in conjunction with the backstops.

ACCURACY

CHECKING THE ACCURACY OF YOUR MACHINE

All functional surfaces of the Magnabend are manufactured to be straight and flat to within 0.2 mm over the entire length of the machine.

The most critical aspects are:

1. the straightness of the working surface of the bending beam,
2. the straightness of the bending edge of the clamp bar, and
3. the parallelism of these two surfaces.

These surfaces can be checked with a precision straight-edge but another good method of checking is to reference the surfaces to each other. To do this:

1. Swing the bending beam up to the 90° position and hold it there. (The beam can be locked in this position by placing a back-stop clamp collar behind the angle slide on the handle).
2. Observe the gap between the bending edge of the clamp bar and the working surface of the bending beam. Using the clampbar adjusters set this gap to 1 mm at each end (use a scrap piece of sheetmetal, or a feeler gauge).

Check that the gap is the same all the way along the clampbar. Any variations should be within ±0.2 mm. That is the gap should not exceed 1.2 mm and should not be less than 0.8 mm. (If the adjustors do not read the same at each end then reset them as described under MAINTENANCE).

Notes:

a. The straightness of the clampbar as observed in elevation (from the front) is not important as this gets flattened out by magnetic clamping as soon as the machine is activated.

b. The gap between the bending beam and the magnet body (as observed in plan-view with the bending beam in its home position) is normally about 2 to 3 mm. This gap is **not** a functional aspect of the machine and does not affect the bending accuracy.

c. The Magnabend can produce sharp folds in thinner gauges and in non-ferrous materials such as aluminium and copper. However in thicker gauges of steel and stainless steel do not expect to achieve a sharp fold (see specifications).

d. Uniformity of the bend in thicker gauges can be enhanced by using scrap pieces of the workpiece to fill in the unused portions under the clampbar.

WORKING SURFACES

If the bare working surfaces of the machine become rusty, tarnished or damaged, they may be readily reconditioned. Any raised burrs should be filed off flush, and the surfaces rubbed with P200 emery paper. Finally apply a spray-on anti-rust such as CRC 5.56 or RP7.

HINGE LUBRICATION

If the Magnabend™ sheetmetal folder is in constant use, then grease or oil the hinges once per month. If the machine is used less, then it may be lubricated less frequently.

Lubrication holes are provided in the two lugs of the main hinge plate, and the spherical bearing surface of the sector block should also have lubricant applied to it.

ADJUSTERS

The adjusters at the ends of the main clampbar are to control the allowance for the thickness of the workpiece between the bending-edge and the bending beam. The adjusters are factory-set to give a thickness allowance of 1 mm when the adjuster indicators "1". To reset this, proceed as follows:

1. Hold the bending beam at 90.
2. Insert a small piece of 1 mm sheetmetal at each end between the bending-edge and the bending beam.
3. Ignoring the indicating marks, adjust the adjusters until the 1 mm pieces are just lightly "nipped" between the bending-edge and the bending beam.
4. Using a 3 mm Allen key, carefully loosen the grub-screw to free the knurled ring of one of the adjusters. Then rotate the ring till the indicating slit indicates "1". Do this without rotating the inner body of the adjuster. Then re-tighten the grub-screw.
5. Reset the other adjuster in the same manner.

The spring-loaded lifting balls in the underside of the adjusters may stick if dirt or rust-forming moisture gets in. If this happens, remedy it by pressing the ball in and out with a blunt tool while spraying in a penetrating lubricant such as CRC 5.56 or RP7.

TROUBLE SHOOTING...

The easiest way to fix electrical problems is to order a replacement electrical module from the manufacturer. This is supplied on an exchange basis and therefore is quite reasonably priced. Before sending for an exchange module you may like to check the following:

1. Machine does not operate at all:

a) Check that power is available at the machine by observing the pilot light in the ON/OFF switch.

b) If power is available but the machine is still dead but feels very hot then the thermal cut-out may have tripped. In this case wait until the machine cools down (about ½ an hour) and then try it again.

c) The two-handed starting interlock requires that the START button is pressed **before** the handle is pulled. If the handle is pulled **first** then the machine will not operate. Also it may happen that the bending beam moves (or is bumped) sufficiently to operate the "angle microswitch" before the START button is pressed. If this happens make sure the handle is pushed fully back first. If this is a persistent problem then it indicates that the microswitch actuator needs adjustment (see below).

d) Another possibility is that the START button may be faulty. If you have a Model 1250E or larger then see if the machine can be started with one of the alternative START buttons or the footswitch.

e) Also check the connector which connects the electrical module with the magnet coil.

f) If clamping does not operate but the clampbar snaps down on release of the START button then this indicates that the 15 microfarad (10 µF on the 650E) capacitor is faulty and will need to be replaced.

g) If the machine blows external fuses or trips circuit breakers when operated then the most likely cause is a blown bridge-rectifier.

2. Light clamping operates but full clamping does not:

a) Check that the "Angle Microswtich" is being actuated correctly.
[*This switch is operated by a square brass piece which is attached to the angle indicating mechanism. When the handle is pulled the bending beam rotates which imparts a rotation to the brass actuator. The actuator in turn operates a microswitch inside the electrical assembly.]*
Pull the handle out and in. You should be able to hear the microswitch clicking ON and OFF (provided there is not too much background noise).
If the switch does not click ON and OFF then swing the bending beam right up so that the brass actuator can be observed . Rotate the bending beam up and down. The actuator should rotate in response to the bending beam (until it clutches at its stops). If it does not then it may need more clutching force. On the 1250E lack of clutching force usually relates to the two M8 cap-head screws at either end of the actuator

shaft not being tight. If the actuator rotates and clutches OK but still does not click the microswitch then it may need adjusting. To do this first unplug the machine from the power outlet and then remove the electrical access panel.

On the Model 1250E the turn-on point can be adjusted by turning a screw which passes through the actuator. The screw should be adjusted such that the switch clicks when the bottom edge of the bending beam has moved about 4 mm. (On the 650E and 1000E the same adjustment is achieved by bending the arm of the microswitch.)

b) If the microswitch does not click ON and OFF even though the actuator is working properly then the switch itself may be fused inside and will need to be replaced.

c) If your machine is fitted with an auxiliary switch then make sure it is switched to the "NORMAL" position. (Only light clamping will be available if the switch is in the "AUX CLAMP" position.)

3. Clamping is OK but Clampbars do not release when the machine switches OFF:

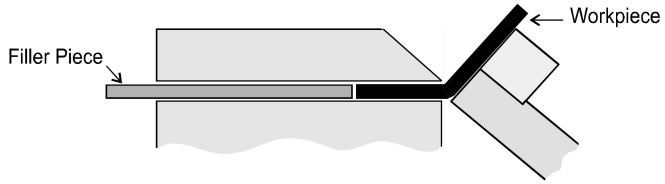
This indicates a failure of the reverse pulse demagnetising circuit. The most likely cause would be a blown 6.8 Ω power resistor. Also check all diodes and also the possibility of sticking contacts in the relay.

4. Machine will not bend heavy gauge sheet:

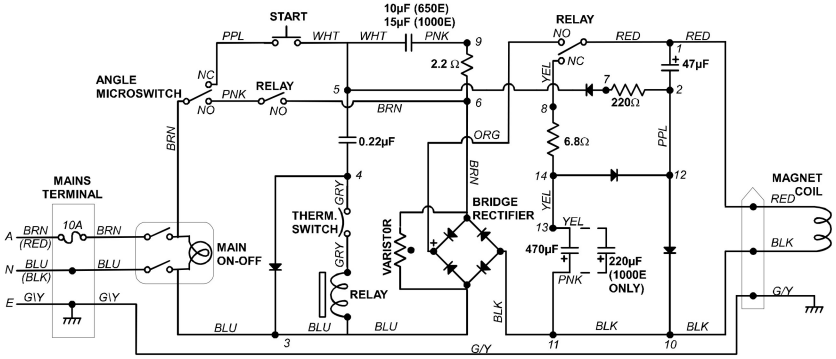
a) Check that the job is within the specifications of the machine. In particular note that for 1.6 mm (16 gauge) bending the **extension bar** must be fitted to the bending beam and that the minimum lip width is **30 mm**. This means that at least 30 mm of material must project out from the bending edge of the clampbar. (This applies to both aluminium and steel.)
Narrower lips are possible if the bend is not the full length of the machine.

b) Also if the workpiece does not fill up the space under the clampbar then performance may be affected. For best results always fill up the space under the clampbar with a scrap piece of steel the same thickness as the workpiece. (For best magnetic clamping the filler piece should be steel even if the workpiece is not steel.)

This is also the best method to use if it is required to make a very narrow lip on the workpiece.

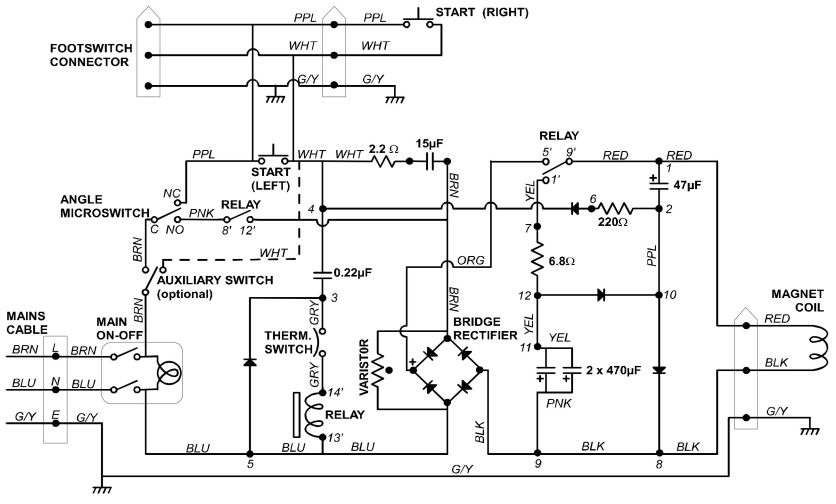


CIRCUIT DIAGRAMS



MAGNABEND™ 650E & 1000E CIRCUIT

2003 02 04



MAGNABEND™ 1250E CIRCUIT

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