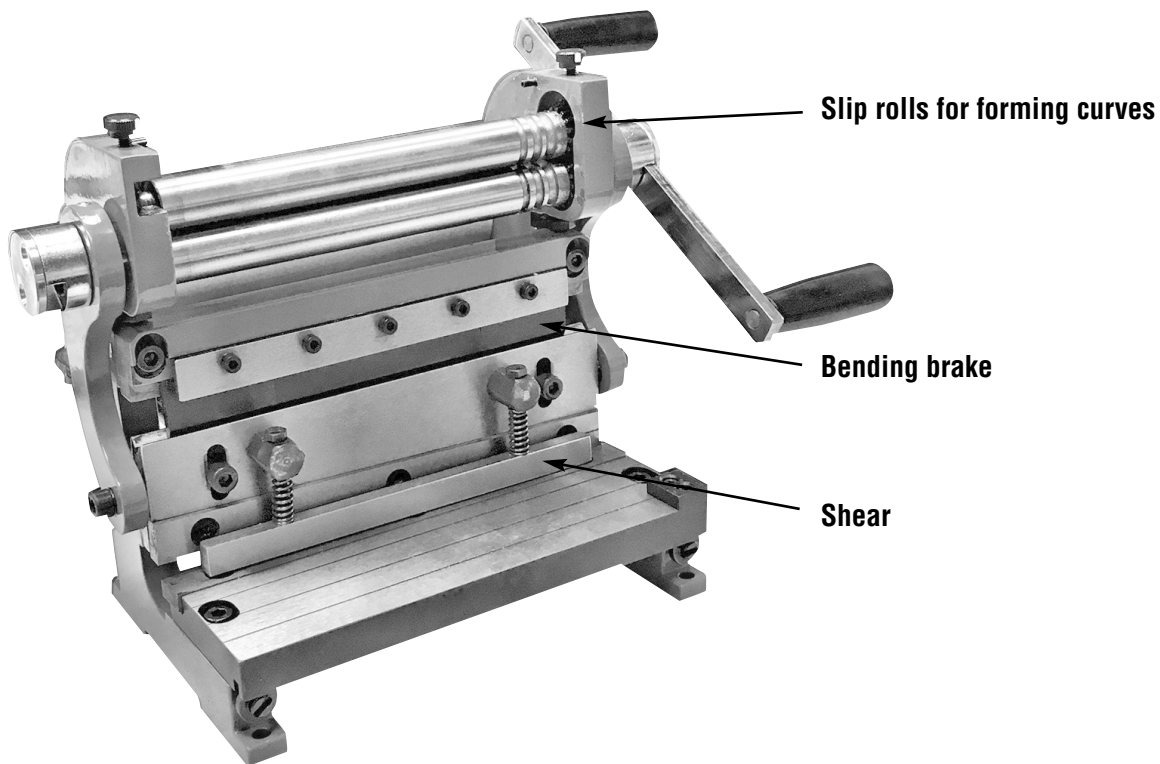


## #86556 3 in 1 Metal Worker Auxiliary Operating Instructions



### Application

Use this machine to shear, bend and curve thin metal sheet and strip (and some plastic and wood sheets) up to 22 gauge (about 1/32" thick) and up to 8 inches wide. The capacity of the machine depends on several material parameters:

- hardness or softness of the material
- the length of the bend or cut
- the radius of bend
- the thickness of the material
- the direction of the grain in the material  
(yes . . . look closely: even metal sheet has a grain direction).

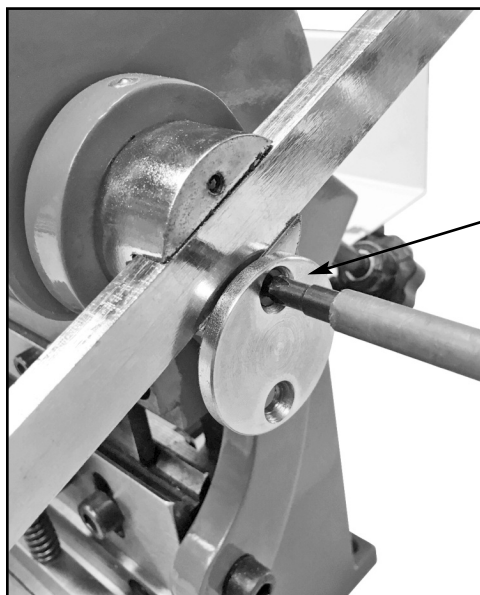
### PRODUCT LIABILITY DISCLAIMER

Micro-Mark makes no warranty of any kind, expressed or implied in respect to this product.  
Buyer assumes all risk and liability whatsoever resulting from use of this product.

Capacities are approximate. Actual results will vary, and can typically be determined by trial and error. Experience will teach you the limits of the machine for the material you are using.

The machine is comprised of three vertical sections . . . all activated by a single hand lever:

- The top section contains the slip rolls for forming curves.
- The center section contains the bending brake.
- The bottom section contains the shear.



The handle can be repositioned on either side of the machine; remove the two screws holding the cover plate on the end of the cam shaft to remove and then replace the handle on the other end of the machine.

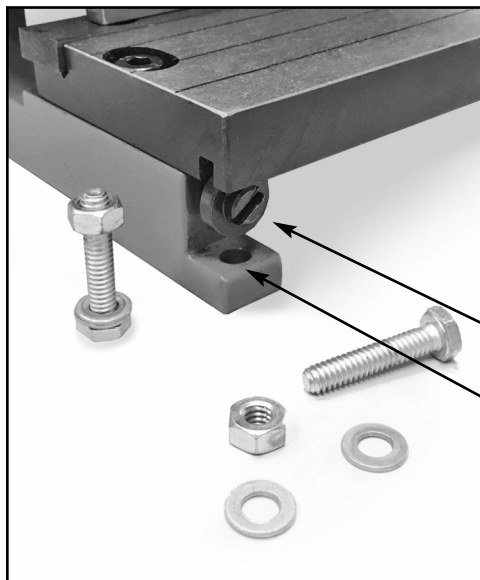
**Remove cover to move crank from one end of machine to the other**

The machine is equipped with an adjustable material stop so that you can make duplicate pieces up to 6" long.

All the machine parts are adjustable, so you can attain peak performance from the machine.

The shear shares a common ram (cutting plate) with the bending brake.

The cam-action of the side levers makes for powerful shearing and bending action without the need to apply extraordinary effort through the handle.



Before you begin, it is important that the machine be anchored to your work surface so that it cannot tip over when you pull the handle. Each installation is unique to the geometry of users' workbenches. So, procure the bolts, nuts and washers you need from your local hardware store to securely attach the machine through the holes provided in the 4 mounting feet. We recommend 1/4-20 steel hardware; run the bolts up from the bottom, through your workbench, and into nut-washer assemblies placed on the top side of the feet. Note: avoid fouling the table-position adjusting screws located under the front corners of the table.

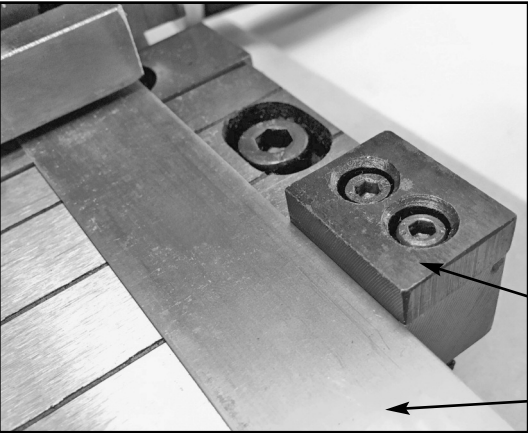
**Avoid fouling this adjuster**

**Mount machine to your workbench with 1/4-20 bolts through these holes**

The machine comes from the factory with all adjustments pre-set for good operation; however, during transport, settings may shift. If you do not get good performance with the machine right out of the box, please see the adjustment procedures below.

Note: The pivoting slip roll cover on the top of the machine is there to protect the rollers from debris which can ruin the surface finish of your workpieces. If you find the cover is in your way, you can remove it by taking out the grub (set) screw that acts as a pivot on one end; then, slide off the cover.

**Operating the Shear**

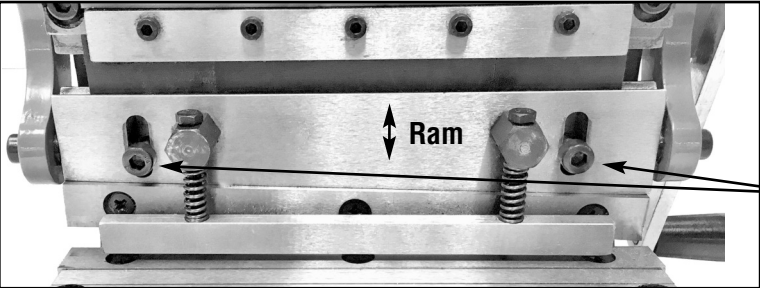


The bottom-most section of the machine contains the shear. Position the handle so that the cutting blades are farthest apart and the hold-down bar is elevated to its maximum height. Insert the workpiece, and then pull the handle. The hold-down bar (pressing plate) will press down on the material and hold it flat against the table surface to reduce curling. Then the shear will cut the material. To assure the cuts are square with the edge of the material, align the edge of the material with the guide block (positioner) mounted to the near right side of the table.

**Guide block**

**Workpiece**

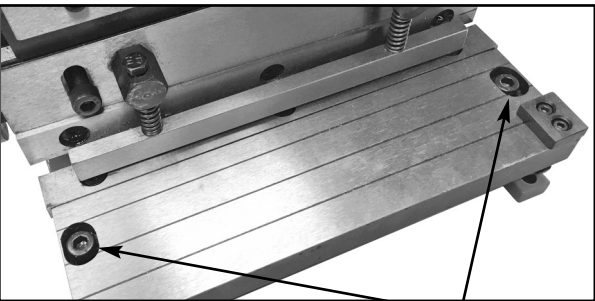
**Adjusting the Shear**



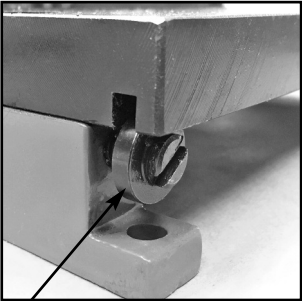
The two bolts in the face of the ram are to be adjusted to allow free vertical movement of the ram without any horizontal looseness. Use the lock nuts on the rear side to secure.

**Adjust these two bolts for sliding fit of ram**

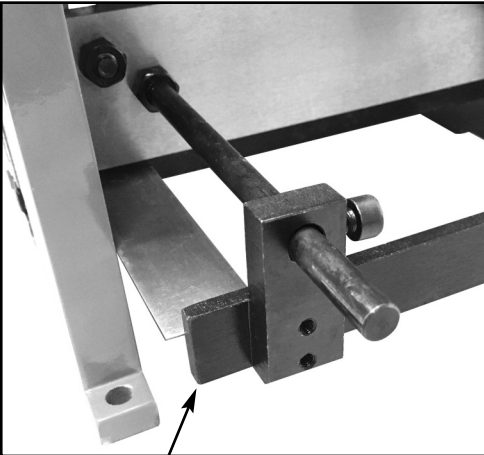
Then, the cutting blades of the shear can be adjusted for best action by loosening the two lock bolts located in the oblong holes on each end of the table. Lower the blade, and then shift the table using the table-position adjusting screws located under the front corners of the table. The cutting edges should just touch with even and slight contact pressure along their entire length. Make sure the cutting surfaces do not overlap when activating the crank handle, or damage to the cutting edges will result. When everything works properly, tighten the two lock bolts to hold the table in position.



**Lock bolts**



**Table position  
adjusters (2)**



**Stop bar in downward  
position for use with Shear**

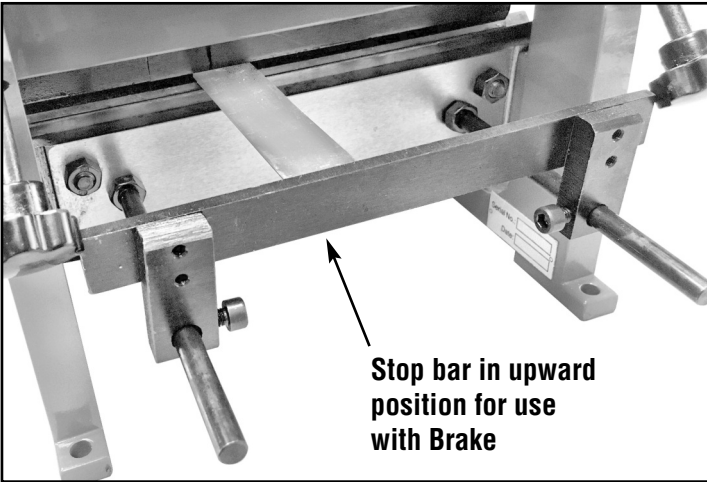
On the rear side of the machine (the side opposite the work table), you can set the position of the stop bar for duplicating cuts without repeated measuring and marking. For the shear, the stop bar should hang downward from the two mounting rods protruding from the rear of the machine.

# Operating the Bending Brake



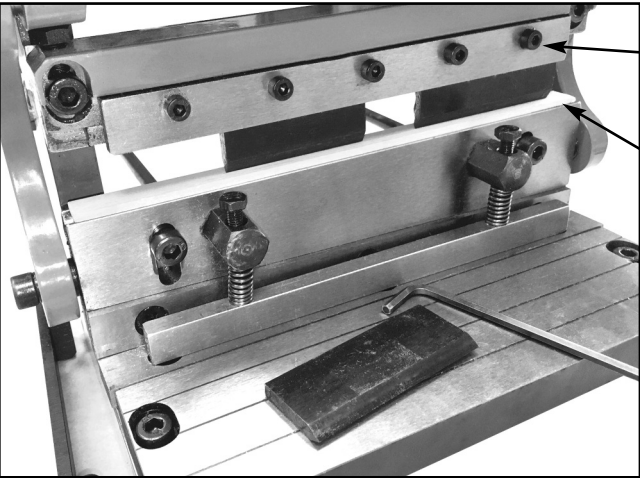
The bending brake has a V-shaped blade plus a matching groove in the top of the ram. Use the crank to lower the ram, and then insert the stock in the gap between the blade and the ram. Note: The two spring-loaded bolts for the hold-down bar may interfere with the insertion of the workpieces, but will move out of the way during the bending operation. Turning the crank will put a relatively sharp bend the material. Take note of the grain direction in the material: a bend running parallel to the grain may cause the material to crack; whereas, bending across the grain may produce a better result.

To make repeated bends at the same distance from the edge of various workpieces, place the stop bar in the upward direction from the two mounting rods protruding from the rear of the machine. The angle of the bend will depend on the thickness of the material and the amount the crank is turned.



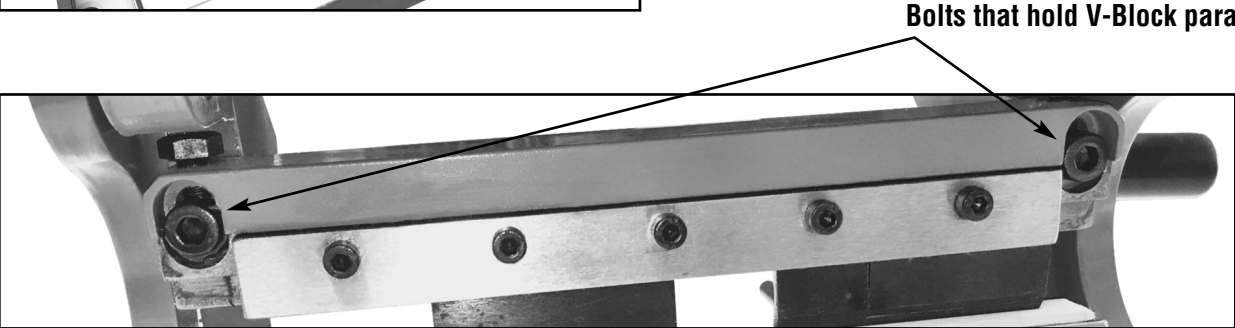
# Adjusting the Bending Brake

The V-block is made up of separate pieces, which may be spaced apart or even removed to allow bending up, for example, the corners of a box. To reposition the V-block, loosen the 5 bolts across the top of the retainer plate. The two bolts on the extreme ends of the V-block allow adjustment of the assembly to be parallel with the ram.



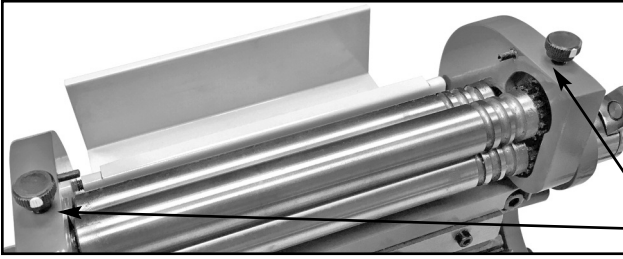
Loosen these 5 bolts to relocate V-Blocks

Use a strip of wood to place bottom edge



## Operating and Adjusting the Slip Rolls

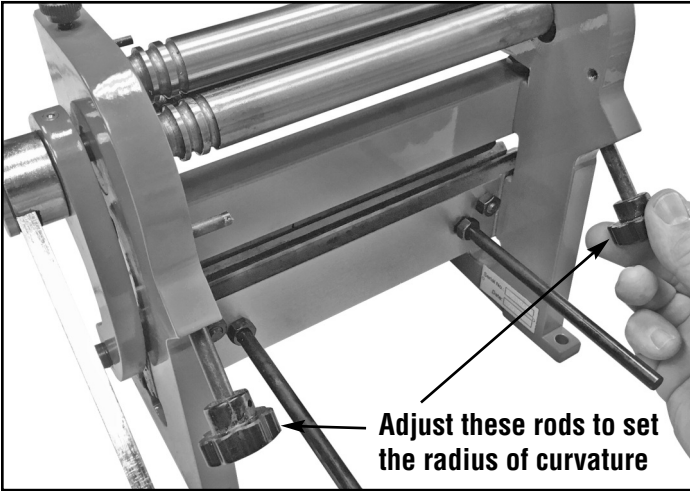
Running sheet stock through the three slip rolls will cause it to curve. The two front rolls drive the material, via the hand crank, into the slip roll mechanism; the rear roller is positioned to produce the desired curve in the workpiece.



Set the vertical spacing of the two front rolls by turning the thumb screws located on the top of each end plate. Start with the two rollers touching evenly along their length, and then turn the screws equally (you can add a small dot of paint for reference) until the workpiece will just fit between, and be driven by, the rollers.

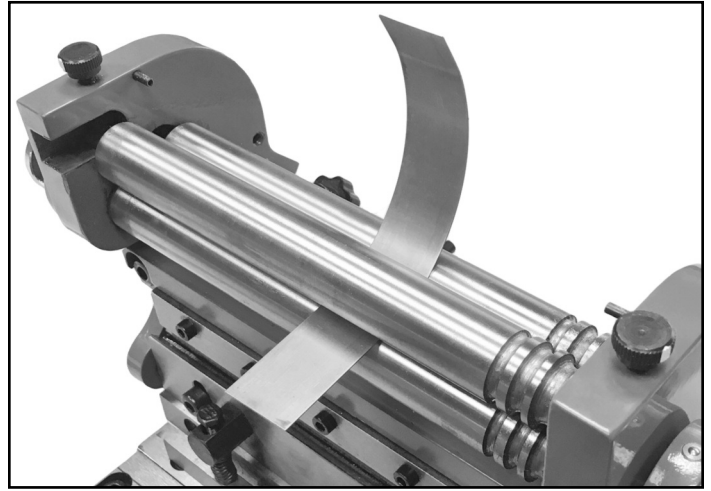
**Thumb screws to tighten drive rollers**  
**(Note dash of white paint as reference mark)**

### Forming a curve with the slip rolls.



**Adjust these rods to set the radius of curvature**

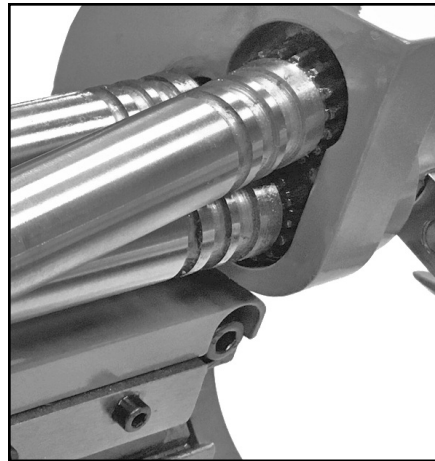
Adjust the position of the rear roller by turning the two knobs hanging out the back of the machine. Placing them closer to the two drive rollers produces a tighter-radius curve. Placing the rear roller at an angle produces a conical shape.



Cylinders may be formed with the slip rolls. To extricate the finished object from the rollers, loosen the top thumb screws and remove the top roller . . . left side first.



**The top roller is removable so you can extricate a newly formed cylinder.**



**The grooves located in the end of the rollers are for bending tubing and round stock**

If a straight section of stock protrudes from one end of the curve, reverse the material and feed it again through the rollers.

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