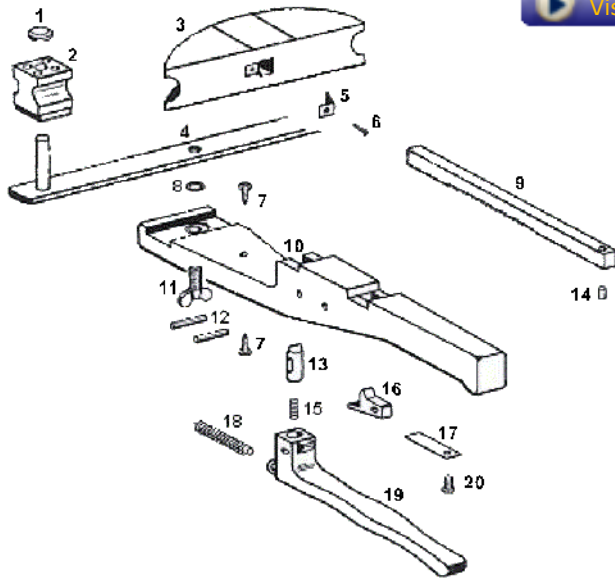


# Replacement Parts (Exploded View)



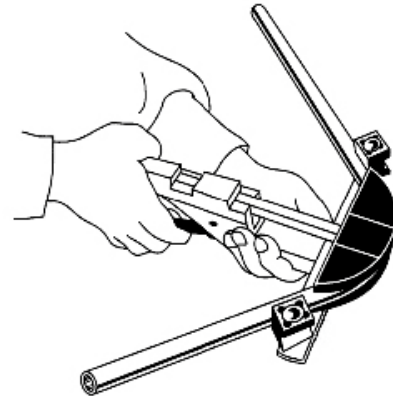
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## Ratchet Hand Bender



Easy one hand bending of 1/4" to 7/8" soft copper, aluminum and light wall hydraulic tubing. Hard copper must be annealed before bending.

- ... Quick change bending mandrels and shoes
- ... Trouble free ratchet mechanism
- ... Index marks to locate bends
- ... Complete tube bender kit includes all items required to bend 1/4", 5/16", 3/8", 1/2", 5/8", 3/4" and 7/8" tubing.

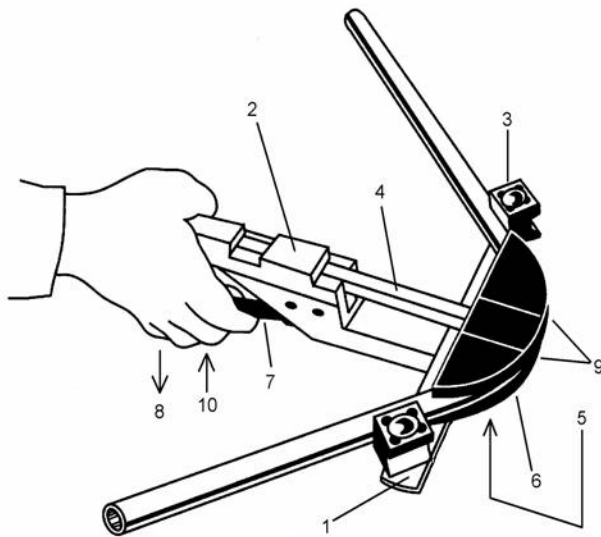


Diagram Number	Description	Part Number
3	Bending Mandrels complete (Includes pieces 3, 5 & 6) Available sizes 1/4" - 7/8"	1/4" - 60326 5/16" - 60327 3/8" - 60332 1/2" - 60333 5/8" - 60334 3/4" - 60335 7/8" - 60336
4	Crossbar shoe assembly complete 3/4" - 7/8" (Includes pieces 4, 1 & 2)	60329
4	Crossbar assembly complete 1/4" - 5/8" (Includes pieces 4, 1 & 2)	60330
5	Clamping Spring	n/a
6	Sheet metal screw	n/a
7	Fillister head screw	n/a
8, 11	Wing nut and e-clip	60348
9	Ratchet bar	60340
10	Bender body housing	60343
12	Spiral pin	n/a
13	Catch pin	60344
14	Catch bolt	n/a
15	Pressure spring	n/a
16	Catch lever	60345
17	Flat spring	60346
18	Tension spring	60349
19	Feed lever	60347
20	Fillister head screw	60328

UPC#	Description	Bending Radius
60331	Complete Kit	-
60326	1/4" O.D. Bending Mandrel	1"
60327	5/16" O.D. Bending Mandrel	7/8"
60332	3/8" O.D. Bending Mandrel	1-3/16"
60333	1/2" O.D. Bending Mandrel	1-3/8"
60334	5/8" O.D. Bending Mandrel	1-15/16"
60335	3/4" O.D. Bending Mandrel	2-13/16"
60336	7/8" O.D. Bending Mandrel	3-3/8"
60329	Crossbar Assembly Complete 3/4" to 7/8"	-
60330	Crossbar Assembly Complete 1/4" to 5/8"	-
60338	Plastic Carrying Case	-
60339	Ratchet Body	-
60342	Reverse Bending Kit	-
60101	Small Cutter for 1/8" to 1-1/8" OD	-
60161	Tube Reamer - 1/16" to 1-3/8"	-



# Operating Instructions



(Figure 1)

## Preparing Unit for Operation

Choose the desired size bending mandrel (6) and slide the square hole on the ratchet bar (4). Fasten the correctly sized crossbar assembly (1) on the bender body (2), so that the desired size bending shoes (3) are in the same plane as the mandrel. Use the wing screw (5) to fasten. The bending shoes are marked with the various tube sizes. Rotate the desired size shoe to face the bender handle. Pull the feed lever (7) away from the handle in the indicated direction (8) and push the mandrel and ratchet bar back towards the handle. Release feed lever (7). You are now ready to bend tubing.

## Bending Operation

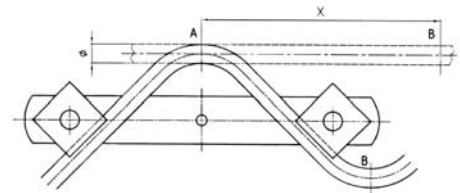
Put your tubing between the mandrel and bending shoes making sure the bending shoe (3) and mandrel (6) are matched for size. Squeeze the feed lever a few times in the indicated direction (10) to begin the bend. When the bender is in the desired position, continue squeezing the lever until the bend is complete. To remove the tube, pull the feed lever (7) away from the handle in the indicated direction (8), push the mandrel back toward the handle and take the tubing out.

**CAUTION:** Annealed tubing must be cooled prior to bending so bending mandrel and bending shoes are not damaged.

## Tool Maintenance

This unit is maintenance free, no service is required.

## Minimum Distance Between Bends



Tubing Diameter	Inches	(mm)
1/4"	4"	102
5/16"	4"	102
3/8"	5"	127
1/2"	5"	127
5/8"	5.5"	140
3/4"	8.5"	216
7/8"	8.5"	216

## Optional Reverse Bending Kit 60342

To bend tubing from the outside of the bend, **Adapter Kit 60342** which mounts on the bender

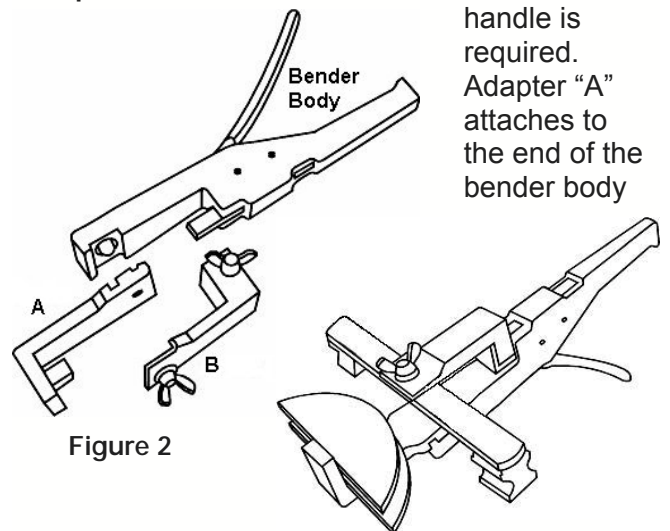


Figure 2

handle is required. Adapter "A" attaches to the end of the bender body

Figure 3

(Figure 2) where the correctly sized crossbar is normally fastened. Adapter "B" mounts to the end of the square ratchet bar (4). The bending mandrel is installed onto the square at the end of the "A" adapter. The crossbar is fastened with the screw to the end of adapter "B" (See Figures 1, 2 & 3).

The bend alignment and bending are done as in figure 1.

## Bend Location Index

Use the two indexes (9) on top of the mandrel to locate your bends. If the desired bend is to be finished 10 inches from the left end of the tube, locate the 10-inch mark to the right side index and bend. Likewise, if the desired bend is to be 10 inches from the right, locate the 10-inch mark to the left side index and bend.