

Exactol® Crank-Operated Benders

Models 412/424

These portable benders are vise or bench mountable for easy action and fast accurate bending to 180°. Two models are available to bend tube sizes 4 (1/4") through 24 (1 1/2"). Exactol benders are designed with a worm-gear drive with a 60 to 1 gear ratio to allow accurate bending with minimum effort. They bend aluminum, copper, annealed steel and annealed stainless steel without kinks or wrinkles. Easy crank operation permits continuous production without excessive operator fatigue; for use in tube fabrication shops, in the field, or in factory maintenance departments.

A video (on DVD) is included to provide proper instructions for use.

Exactol® Model 412

The Exactol Model 412 will bend tube from size 4 (1/4") through size 12 (3/4") and 6mm through 20mm inclusive and is completely portable. Accessories include a sturdy metal carrying case, which accommodates the 412 bender, slide block, and selected radius blocks. See page R7 for wall thickness capabilities. May be held in a vise or bench mounted using the bench mounting adapter. Bulletin 4391-B400S and DVD are included with bender, which describe the operation in detail.

NOTE: The 412 must be bench mounted if mandrels are used.

COMPONENTS REQUIRED

The minimum components required are a Model 412 Bender with a slide block and a radius block which match the tube O.D. to be bent.

Part Name	Part No.
Exactol Model 412 Bender (for 1/4" through 3/4" O.D.).....	560569
Slide Block (for sizes 4-5-6-8-10-12)	550585
Slide Block (for sizes 6mm-8mm-12mm-12mm-14mm)	820091
Slide Block (for sizes 15mm-16mm-18mm-20mm).....	820092
Radius Blocks (for sizes 4-5-6-8-10-12 and 6mm thru 38mm) ...	See pages R10 – R11

OPTIONAL ACCESSORIES

Carrying Case (for bender, slide block and selected radius blocks)	550572
Bench Mounting Adapter	550570

Mandrel Bending Components

for 412 and 424 Benders See pages R16 – R18



Fig. R8 — 412 Bender



Fig. R9 — Slide Block

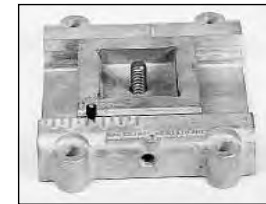


Fig. R10 — Bench Mount Adapter

Dimensions and pressures for reference only, subject to change.

Exactol® Model 412 Kit

This 412 kit contains all the basic tool requirements for bending tube from 1/4" through 3/4".

Part No.
412 KIT

The following part numbers are included in the kit:

Part Name	Part No.
Exactol Model 412 Bender	560569
Carrying Case	550572
Slide Block for 1/4" through 3/4" tube	550585
Radius Block – 1/4" O.D. tube	550579
Radius Block – 3/8" O.D. tube.....	550581
Radius Block – 1/2" O.D. tube.....	550582
Radius Block – 5/8" O.D. tube.....	550583
Radius Block – 3/4" O.D. tube.....	550584



Fig. R11 — 412 Kit

Exactol® Model 424

The Exactol Model 424 will bend tube from size 4 (1/4" O.D.) through size 24 (1 1/2" O.D.) and 6mm through 38mm inclusive. See page R7 for wall thickness capabilities. It is completely portable and may be vise or bench mounted. Bulletin 4391-B400S and video are included with the bender, which describe the operation in detail.

NOTE: The 424 must be bench mounted if mandrels are used.

A video (on DVD) is included to provide proper instructions for use.

COMPONENTS REQUIRED

The minimum components required are a Model 424 Bender with a slide block and a radius block that match the tube O.D. to be bent.

Part Name	Part No.
Exactol Model 424 bender (for 1/4" through 1 1/2" O.D.).....	621044
Slide Block (for sizes 4-5-6-8-10-12)	550585
Slide Block (for sizes 14-16-18-20).....	621045
Slide Block (for size 24)	870150
Slide Block (for sizes 6mm-8mm-10mm-12mm-14mm)	820091
Slide Block (for sizes 15mm-16mm-18mm-20mm).....	820092
Slide Block (for sizes 22mm-25mm-28mm-30mm).....	820093
Slide Block (for size 35mm)	820094
Slide Block (for size 38mm)	870150
Radius Blocks (for sizes -4 thru -24 and 6mm thru 38mm)	See pages R10 – R11

OPTIONAL ACCESSORIES

Bench Mounting Adapter.....	631156
Mandrel Bending Components for 412 and 424 Benders	See pages R16 – R18



Fig. R12 — 424 Bender



Fig. R13 — Slide Block

Dimensions and pressures for reference only, subject to change.

Exactol® Model 424 Kit

Part No. 424 Kit

This 424 Kit contains all the basic tool requirements for bending tube from 1/4" through 1 1/2". The following part numbers are included in the kit:

Part Name	Part No.
Exactol Model 424 bender (for 1/4" through 1 1/2" O.D.).....	621044
Slide Block (for sizes 4-5-6-8-10-12)	550585
Slide Block (for sizes 14-16-18-20).....	621045
Slide Block (for size 24)*.....	870150
Radius Blocks – 1/4" O.D. Tube*	550579
Radius Block – 3/8" O.D. Tube	550581
Radius Block – 1/2" O.D. Tube	550582
Radius Block – 5/8" O.D. Tube	550583
Radius Block – 3/4" O.D. Tube	550584
Radius Block – 1" O.D. Tube	621047
Radius Block – 1 1/4" O.D. Tube	621049
Radius Block – 1 1/2" O.D. Tube*	870149

* Items not shown in the photo, but which are included in the 424 Kit.



Fig. R15 — 424 Kit

Radius Blocks

For use with Exactol Models 412/424 benders.

The 412 and 424 bender radius blocks have built in tube clamps, therefore separate clamp blocks are not required. The radius blocks are interchangeable within bender size ranges. Close bend radius blocks utilize the small bend radii, but also allow the bend to begin closer to the end connection.

412 and 424 Bender – Small Bend Radius Blocks

Size	Tube O.D. (in.)	Bend Radius (in.)	Part No.
4	1/4	9/16.....	550573
5	5/16	11/16.....	550574
6	3/8	15/16.....	550575
8	1/2	1 1/4.....	550576
10	5/8	1 1/2.....	550577
12	3/4	1 3/4.....	550578



Fig. R16 — Small Bend Radius Block

412 and 424 Bender – Large Bend Radius Blocks

Size	Tube O.D. (in.)	Bend Radius (in.)	Part No.
4	1/4	3/4.....	550579
5	5/16	1.....	550580
6	3/8	1 1/4.....	550581
8	1/2	2.....	550582
10	5/8	2 1/2.....	550583
12	3/4	3.....	550584
14	7/8	3 1/2.....	621046
16	1	4.....	621047
18	1 1/8	4 1/2.....	621048
20	1 1/4	5.....	621049
24	1 1/2	5.....	870149



Fig. R17 — Large Bend Radius Block

Dimensions and pressures for reference only, subject to change.

412 and 424 Bender – Close Bend Radius Blocks

These adapters are used when bends are needed close to the end of the tube after the flare has been made, ferrule has been pre-set, or flange has been made. For flared or Ferulok fittings, attach tube end by threading tube nut onto the radius block threaded pin. To use this block with Seal-Lok fittings, Close Bend Adapters for Seal-Lok must be used to attach the tube to the radius block.

Size	Tube O.D. (in.)	Bend Radius (in.)	Part No.
8	1/2	1 1/4.....	590533
10	5/8	1 1/2.....	590535
12	3/4	1 3/4.....	590537



Fig. R18 — Close Bend Radius Block

Close Bend Adapters for Seal-Lok

These adapters are used when bends are needed close to the end of the tube after the flange has been made or the sleeve has been brazed onto the end of the tube.

HOW TO USE: Screw the Seal-Lok adapter into the internal thread* of the threaded pin on the radius block. Then attach the flanged or brazed tube by threading the tube nut to the Seal-Lok adapter on the radius block threaded pin.

* If the threaded pin does not have an internal thread, a new threaded pin is required.

Tube O.D. (in.)	Description	Part No.
1/2	Seal-Lok Adapter.....	930421-8
5/8	Seal-Lok Adapter.....	930421-10
3/4	Seal-Lok Adapter.....	930421-12
1	Seal-Lok Adapter.....	930421-16
1 1/4	Seal-Lok Adapter.....	930421-20
1 1/2	Seal-Lok Adapter.....	930421-24
1/2	Threaded Pin (for Close Bend Radius Blocks) ..	930420-8
5/8	Threaded Pin (for Close Bend Radius Blocks) ..	930420-10
3/4	Threaded Pin (for Close Bend Radius Blocks) ..	930420-12
1	Threaded Pin (for Close Bend Radius Blocks) ..	930420-16
1 1/4	Threaded Pin (for Close Bend Radius Blocks) ..	930420-20
1 1/2	Threaded Pin (for Close Bend Radius Blocks) ..	930420-24



Fig. R19 — Seal-Lok Close Bend Adapter

412 and 424 Bender – Metric Radius Blocks

Tube O.D. (mm)	Bend Radius (mm)	Part No.
6	14.....	820090-6mm
8	18.....	820090-8mm
10	24.....	820090-10mm
12	32.....	820090-12mm
14	38.....	820090-14mm
15	38.....	820090-15mm
16	38.....	820090-16mm
18	44.....	820090-18mm
20	44.....	820090-20mm
22	89.....	820090-22mm
25	102.....	820090-25mm
28	102.....	820090-28mm
30	127.....	820090-30mm
32	127.....	820090-32mm
35	127.....	820090-35mm
38	127.....	870149 (same as 1-1/2" Radius Block)



Fig. R20 — Radius Block

Dimensions and pressures for reference only, subject to change.