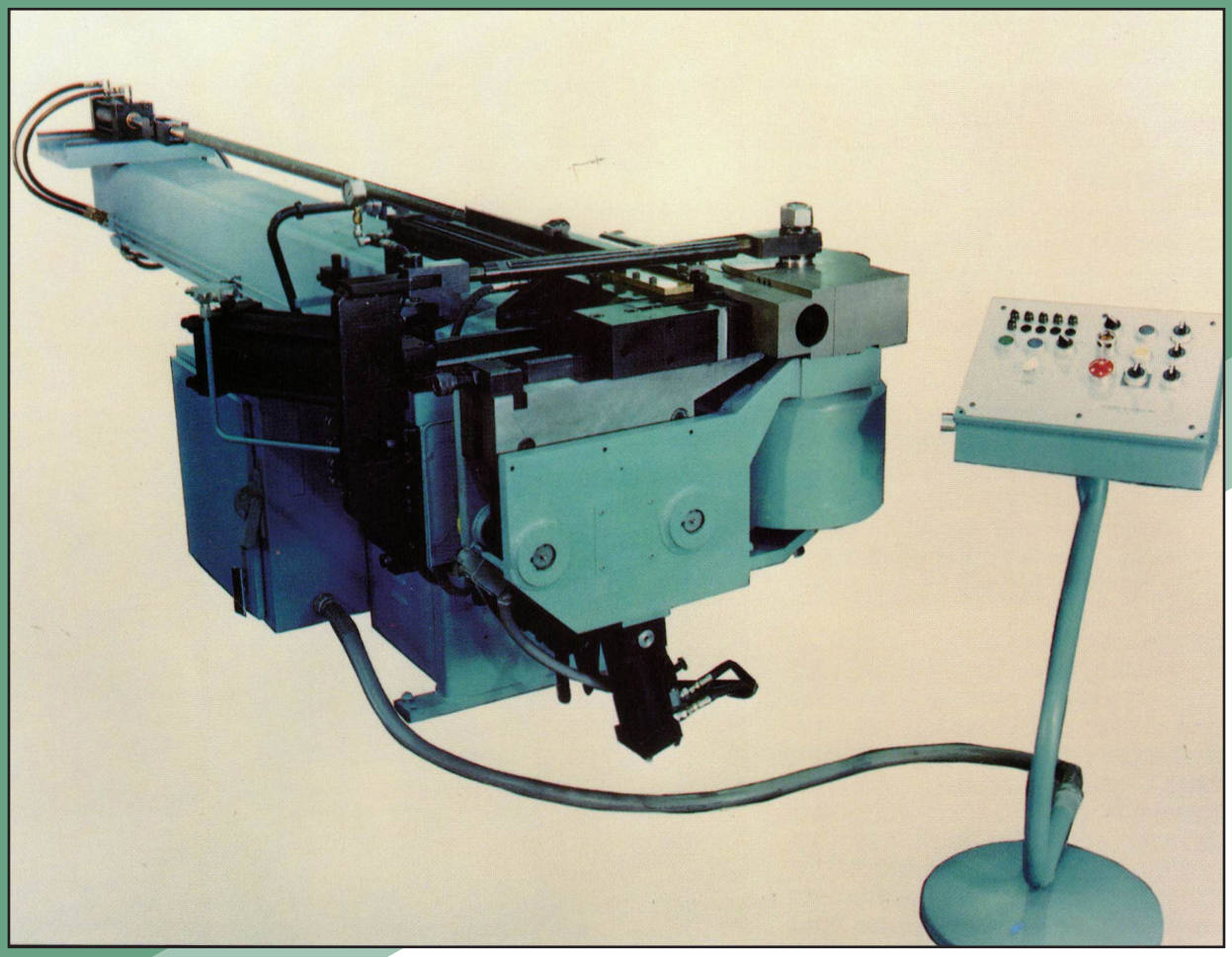
Rotary Hydraulic Precision Tube Benders



ULTIMATE TUBE BENDER PARTS PLUS, INC.

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Capacity	Machine Model CL-200 *UTB CL-200*	CL-200HD *UTB CL-200 HD*	CL-300 *UTB CL-300*	CL-300HD *UTB CL-300 HD*	CL-400 *UTB CL-400*
Round Tube - 25,000 psi-YP, non-ferrous 40,000 psi-YP, ferrous 60,000 psi-YP, stainless steel	 1.5" X .188" 1.5" X .109" 1.5" X .049"	 2.5" X .203" 2.5" X .109" 2.0" X .125"	 3" X .210" 3" X .120" 3" X .065"	 4" X .203" 4" X .109" 4" X .065"	 6" X .250" 6" X .165" 6" X .125"
Schedule 80, steel pipe, IPS	1 (1.315" X .179")	1-1/2 (1.9" X .2")	2 (2.375" X .218")	2-1/2 (2.875" X .276")	4 (4.5" X .337")
Round bar, mild steel	1 -1/8"	1 -3/8"	1 -7/8"	2 -1/4"	3 -1/2"
Centerline radius, (max.) std.	10"	10"	12"	12"	24"
Tube length over mandrel, (std.)	10'	10'	10'	10'	12' -6"

Specifications

Maximum Bend Angle	180º + 15º Overbend Allowance				
Hydraulic Drive (Std.)	5HP	10HP	10HP	15HP	15HP
Bend Arm Speed (Max.) Adjustable	17 RPM	10 RPM	5-1/2 RPM	3.8 RPM	2.3 RPM
Bend Arm Accuracy	Within ± 1/4º				
Approx. Shipping Weight (Less Oil & Tools)	2780 lbs.	3000 lbs.	4800 lbs.	5000 lbs.	14000 lbs.

OPTIONS

1. Clockwise or counterclockwise rotation to bend.
2. Mandrel extractor and rod support.
3. Mandrel rods (one supplied w/machine).
4. Motorized mandrel tangency adjust.
5. Draw compound mandrel injector system.
6. Mandrel rods for draw compound injector.
7. Wiper die bracket.
8. Drop-away clamp.
9. Vertical die closer.
10. Auto lubricator.
11 . Direct-acting pressure die.
12. Pressure die booster.
13. overarm support.
14. Extended centerline radius capability.
15. Additional H.P.
16. Degree of bend stop systems
    (single stop standard)
    a. Ten-stop manual advance dial.
    b. Ten-stop auto advance dial.
    c. Digital bend control.
17. Plane of bend and distance between bend carriage - ten stops.
18. Runout table for extrusion bending - six stops.
19. Mandrel rod stop - ten stops.
20. Extended bed length.
21. Extended POB carriage way.
22. Extended mandrel rods.
23. Extended runout table.
24. Extended rod stop assembly.
25. water-cooled spindle for heated die bending

STANDARD FEATURES

1. Hardened and ground slides.
2. Hard steel toggle pins on hard steel bearings.
3. Heat-treated alloy spindle on taper roller bearings.
4. JIC hydraulics, cushioned cylinders.
5. JIC Electrics.
6. Swinging arm safety plate.
7. Low noise hydraulics.
8. Independent clamp die, pressure die, and mandrel controls.

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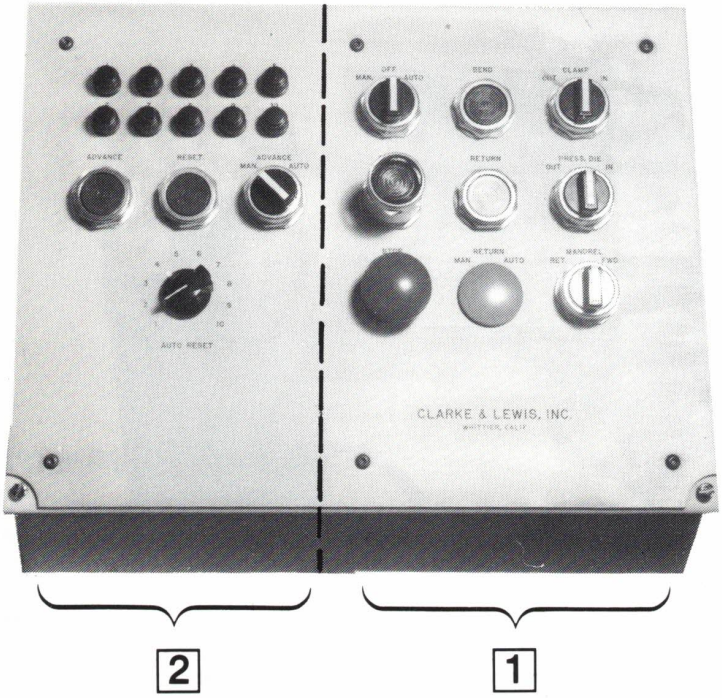
CL-200 and CL-200 HD

The CL-200 and CL-200 HD benders are noted for reliability and productivity. The clamp and pressure die bolsters mount on hard, precision ground steel slides riding on fitted bronze ways.

Precision die alignment is thus maintained ensuring accurate die closure and alignment not only adequate for tubular sections, but also for complex extrusions and soft materials.



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Remote Control Pedestal

Standard controls supplied are shown in 1. Panel controls are provided for AUTO or MANUAL operation. In the MANUAL mode the operator has independent control of the clamp die, pressure die, mandrel, bend and return. In the AUTO mode the control sequences closing of clamp die and pressure die, rotation of bend arm, retraction of mandrel and opening of clamp die in an automatic sequence. Depressing the "return" push button returns the bend arm and advances the mandrel.

Benders are provided with single stop DOB (Degree of Bend or Bend Angle) control. Options are available for a ten-stop dial stop system, ten-stop with auto advance and reset (shown in 2) or a Digital Bend Control unit. The dial stop system allows ten individual bend angles to be set and selected. Any bend angle can be altered without disturbing other settings. The dial system with auto advance and reset enables the operator to select angles for the required number of bends and the system will automatically index through the sequence.

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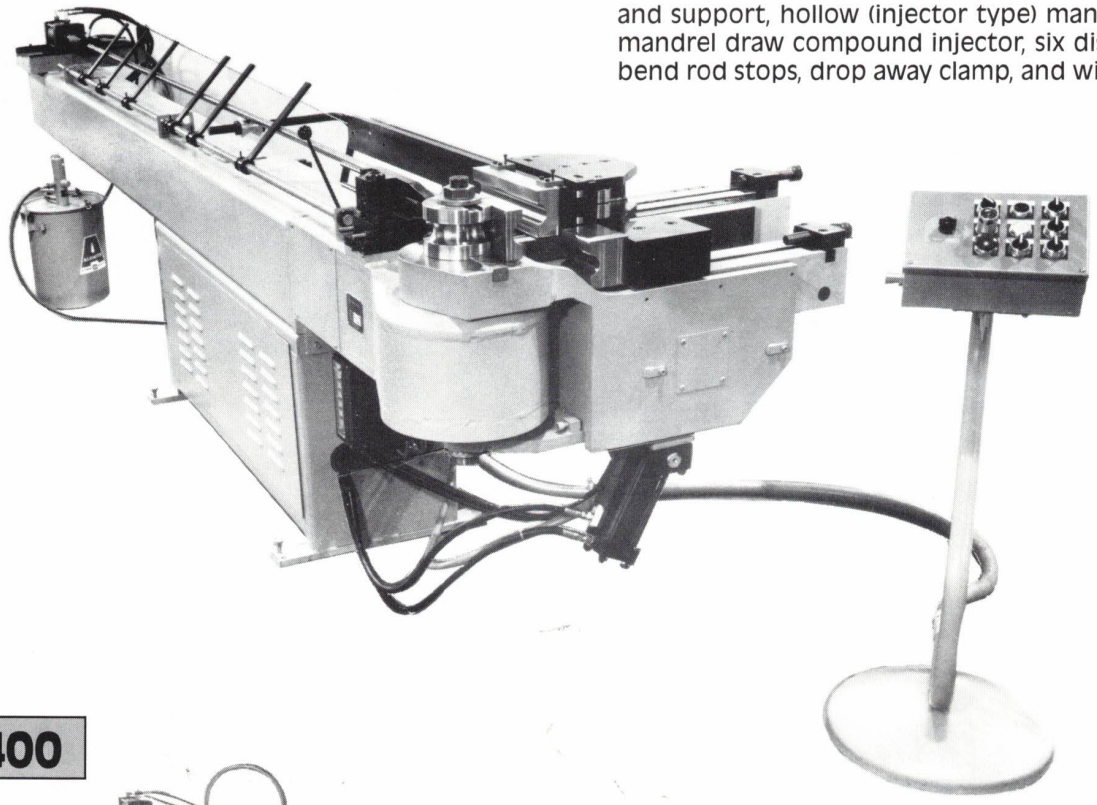
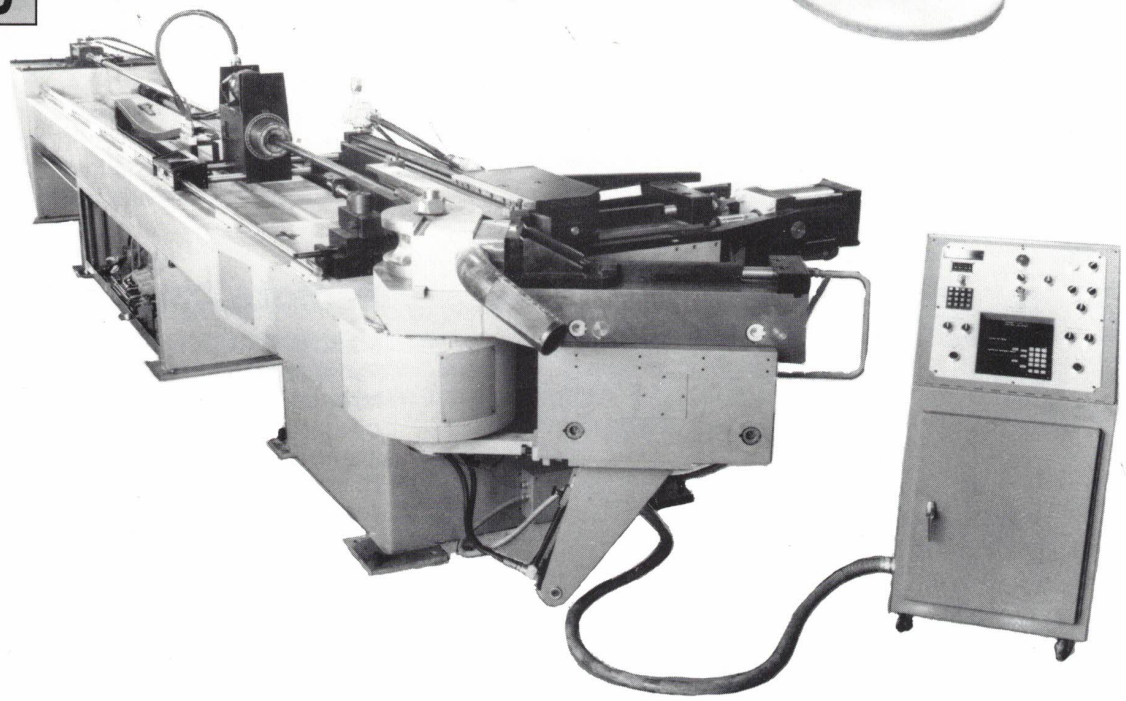
CL-300 and CL-300 HD

The CL-300 Bender shown includes mandrel extractor and support, hollow (injector type) mandrel rod, mandrel draw compound injector, six distance between bend rod stops, drop away clamp, and wiper die bracket.



CL-400



The CL-400 Bender shown includes mandrel extractor and support, mandrel draw compound injector, hollow (injector type) mandrel rod, wiper die holder, drop away clamp, direct acting pressure die with assist, powered carriage with drives for DBB (distance) and POB (plane) with electronic readouts on console, digital bend control, 20 ft. tube length over mandrel.

An optional "gripper-pusher" is available for making tight radius bends on heavy wall pipe with minimum wall thinning. Top loading jaws hold the pipe as it is pushed forward under programmed control. The programmed control provides push from low to high to low hydraulic pressures at selected portions of the bend angle.

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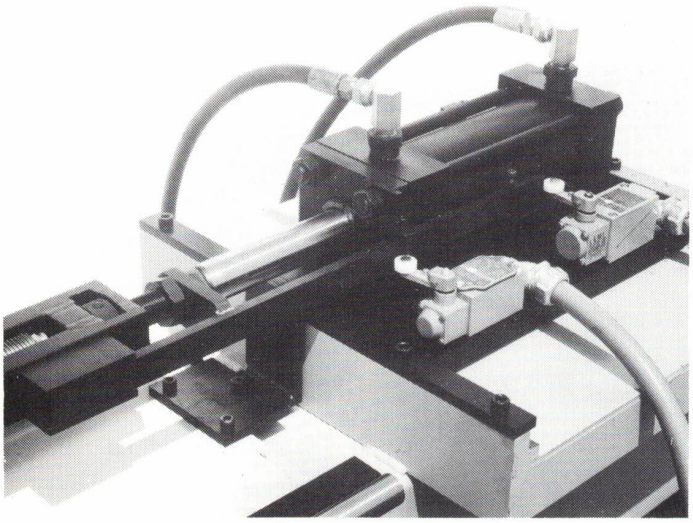
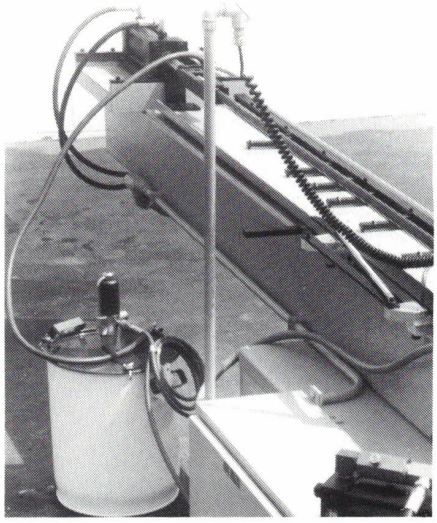
OPTIONS



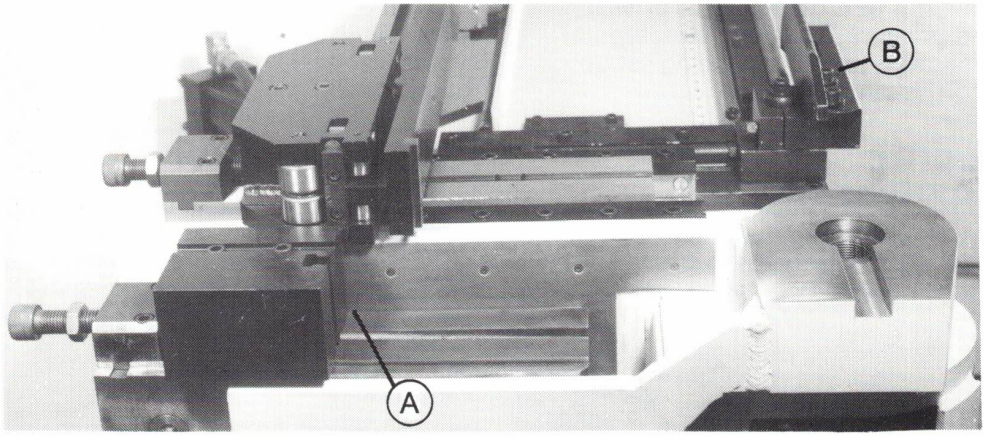
Mandrel Extractor and Support

Required for thin wall bending with mandrels. The mandrel extractor automatically advances the mandrel pre-set bend position and retracts mandrel after bending. Mandrel extractor assembly includes anti-rotation device, rod length adjustment and limit switches for mandrel stroke adjustment. Mandrel rod support retains the mandrel and rod at the correct height in the bend, clamp, and pressure dies. The support is laterally adjustable to accomodate different centerline radii.



Mandrel Draw Compound Injector

Provides draw compound to the inside of the tube being bent during the bending operation, conserving compound and reducing spillage. Compound is hydraulically supplied through a hollow mandrel rod and mandrel lube hole to the work area. Consisting of a pump, hose and fitting, the injector will pump all draw compounds including heavy oils and water base compounds.



Drop-Away Clamp [A]

Allows clamping mechanism and clamp die to retract into the bend arm. After completion of a bend and opening of the clamp die, the slide moves back and down to position the clamp die below the tube. The bent tube can then be advanced without raising the tube vertically. This feature speeds bending operations and reduces tube marking.

Wiper Die Holder [B]

Provides adjustment necessary to align and maintain wiper die position. Allows removal of wiper die without changing set-up. Provides vertical, horizontal, and axial adjustments with locking capability.

Motorized Mandrel Adjustment

Provides motor with push-button control for tangency adjustment of mandrel to bend die for varying centerline radii.

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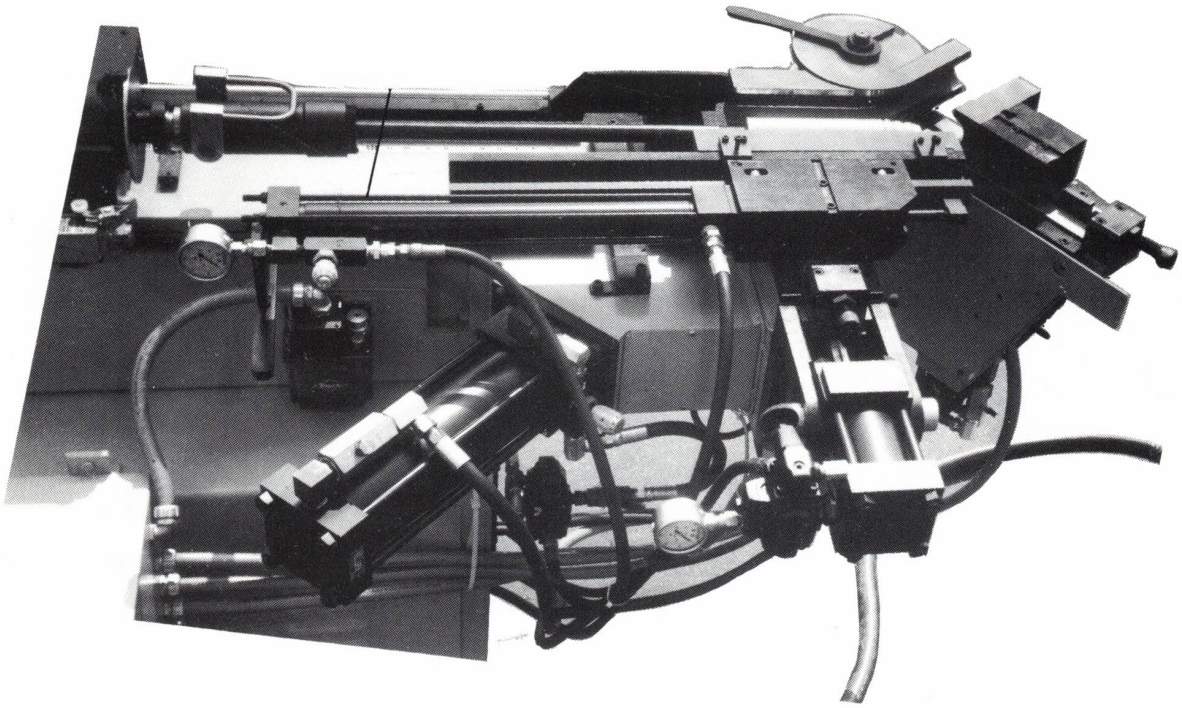
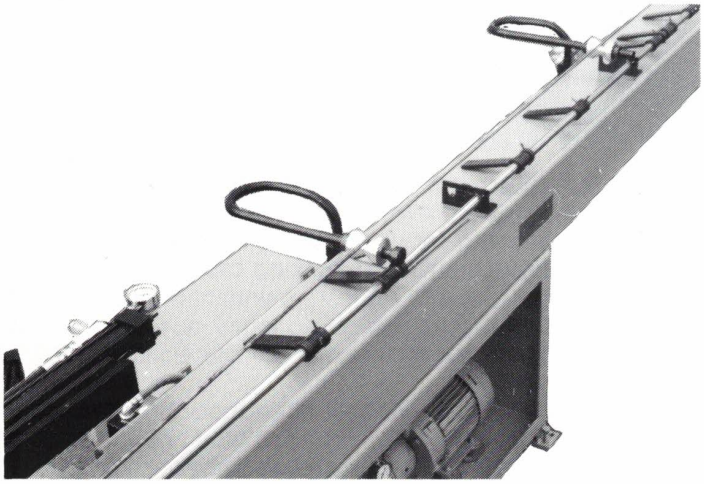


Direct-Acting Pressure Die [A]

Provides direct hydraulic operation of the pressure die by a direct-acting hydraulic cylinder applying force at the tube centerline. Force is independent of pressure die position and variations in tube diameter or wall thickness. Established pressures for given size/type of tubing are easily duplicated thereby reducing set-up time when rerunning the same part.

Overarm Support

Manual swivel clamp to couple stationary arm to bend post for applications requiring high bend and clamp forces. Applicable to tight radius bends in tubes, solids or sections where extreme rigidity of bend die and clamp die is required.



Pressure Die Boost [B]

Provides an axial force to the pressure die to offset frictional forces induced by mandrel and wiper die. Reduces clamp force and bending torque, permitting closer and tighter radius bends. Speed and force applied by the pressure die to the tube are hydraulically controlled. This feature reduces wall thinning.

Auto-Lubricator

Supplies a measured amount of lubrication to moving parts on the swinging and stationary arms. This option reduces wear, extends life, and minimizes maintenance. The system consists of a pump, reservoir, and distribution system.

Vertical Die Closer

Utilizes a hydraulic cylinder to apply adjustable vertical force to compress bend dies used in bending extrusions. Located under the nose of the bender, operation is simultaneous with the clamp die action.

Mandrel Rod Stops

A set of ten or more mechanical stops is available for establishing distance between bends for machines furnished without a plane of bend carriage. Each stop is adjustable over the length of the machine. Positioning of the tube against each stop establishes the correct position for start of the bend.

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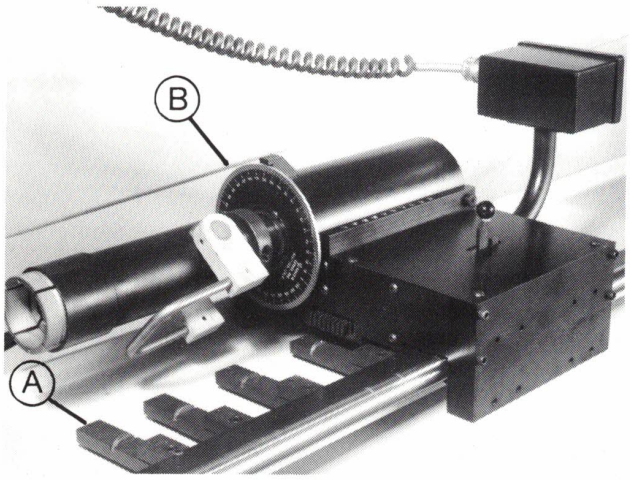
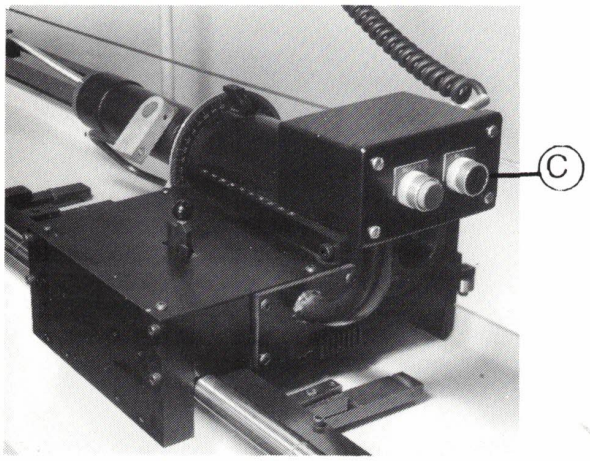
OPTIONS



Plane of Bend and Distance Between Bend Carriage

Manual tube positioning system which provides stops for distance between bends Ⓐ and plane of bend Ⓑ, ten stops each. Each distance between bend stop is interlocked with the corresponding plane of bend stop and both may be coordinated with Dial Bend Stop option or Digital Bend Control. The "BEND" and "RETURN" push buttons Ⓒ on the rear of the carriage permit an operator to "walk" a tube through its sequenced bend commands without using the operator's console. The carriage uses a removable collet (one required for each tube diameter) with an internal locking device to accurately position the tube for bend start. Each plane of bend stop is adjustable to any angle CW or CCW. (Note: Use of this option reduces tube length over mandrel by 24″ and an extension may be required.)

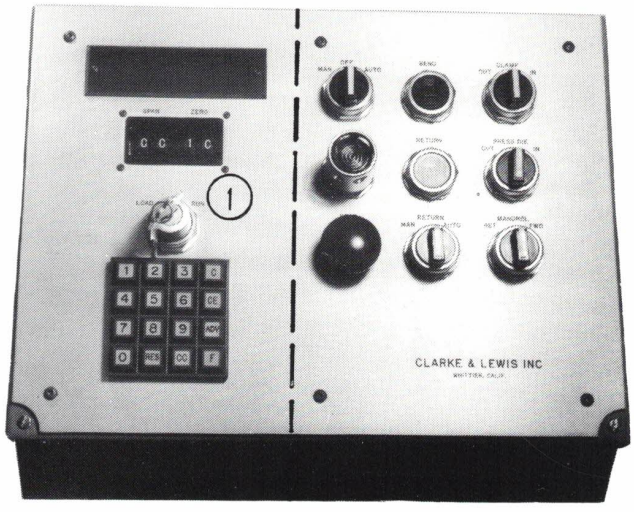


Run-Out Table

Provides a machine bed-mounted table with pneumatic stops. Used as a distance between bends stop system for parts where no mandrel is used (e.g. extrusions). The table may be equipped with six pneumatically actuated stop fingers adjustable over the table length. Stop fingers are actuated by a foot switch.

Digital Bend Control (DBC-100)

The Digital Bend Control is included on the operator's console, shown in ①. The control can store up to 40 bend commands with a resolution of 0.1°. The operator can enter any required number of bends by keyboard selection, which are sequentially advanced. The span and zero controls automatically enter correctional data to compensate for springback and for rapid angular adjustments. Bend number and degree of bend are displayed. The "LOAD-RUN" switch is key locked preventing data reset in the run position.



Tooling

Clarke & Lewis designs and manufactures top quality tooling to bend round or shaped tubing, pipe, extrusions or other sections for all makes and models of rotary draw bending machines. All tooling is manufactured individually or in matched sets guaranteed to fit the make and model of bending machine as specified. All tooling is available in a variety of materials and hardness to meet specific needs. Refer to tooling catalog for complete description.

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