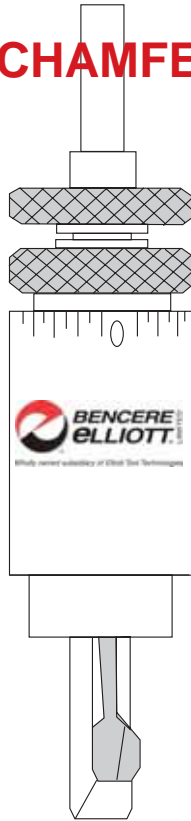
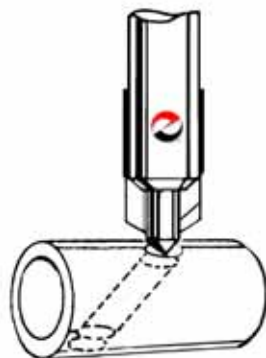
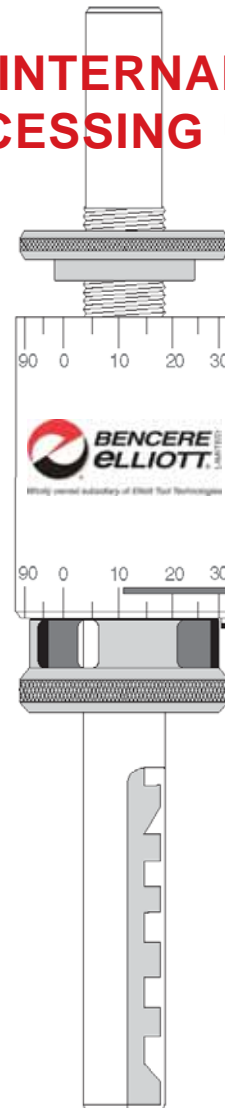


BACK CHAMFER UNIT



INTERNAL RECESSING UNIT



ELLIPTICAL DEBURRING TOOL

Marketed by:

BENCERE ELLIOTT INTERNAL RECESSING UNIT

IRU

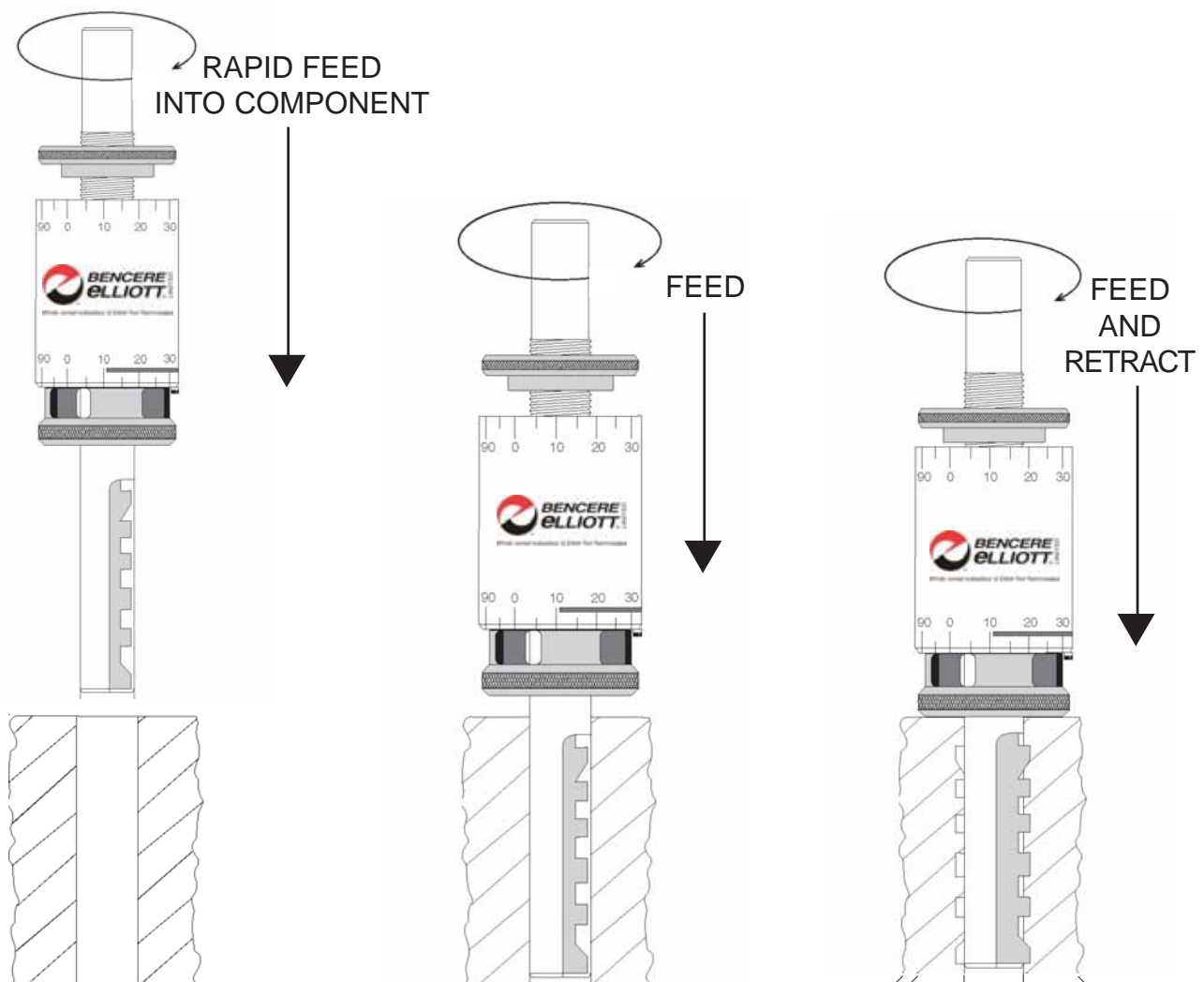
The Internal Recessing Unit is the most efficient method of machining single or multiple grooves in one operation. The Elliott Bencere system is comprised of an operating head, pilot, carrier arm and replaceable form ground cutter.

ZERO DEFLECTION

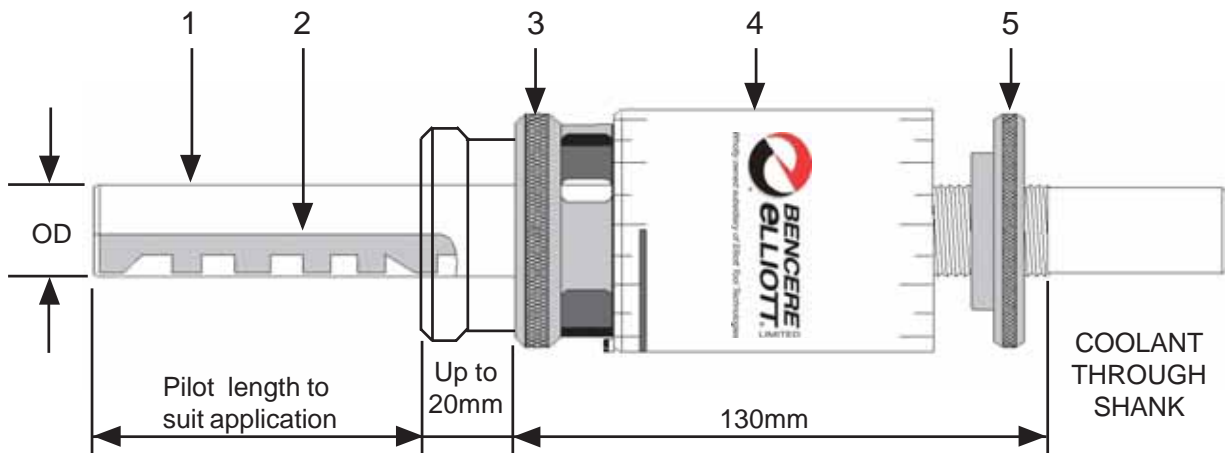
Due to the unique design, the cutter is supported along its entire length by the pilot. This eliminates deflection and ensures precise feature machining with consistent repeatability.

OPERATING PROCEDURE

The recess system feeds into the work-piece with the pilot locating within the component bore. The operating head or optional nose piece makes contact with either the component face or a fixture plate. While feeding forward, the system is actuated, lifting the cutter exactly perpendicular to the axis of rotation at a 2:1 ratio. This machines all features simultaneously, with perfect concentricity. Radial cut depth can be controlled by the limiting nut bottoming out or by the CNC program controlling the tool's feed-depth.



BENCERE ELLIOTT INTERNAL RECESSING UNIT

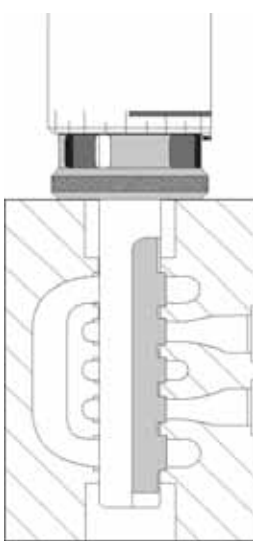


1. Location Pilot (OD ground to suit component bore)
2. Cutter (Replaceable on carrier arm)
3. Adjustment Stop Collar (Actuate IRU with adjustable length of up to 20mm)
4. Operating Head Assembly
5. Limiting Nut (To set cutting diameter - manual operation only)

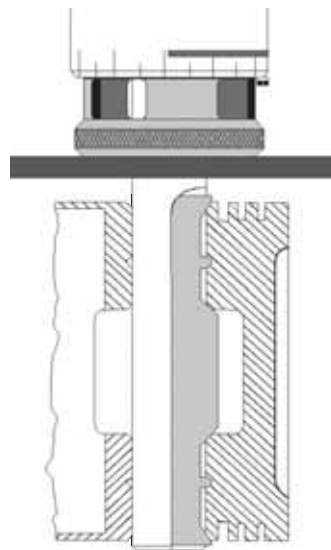
STANDARD FEATURES AVAILABLE:

1. Straight Shank (20mm and 25mm diameter with through coolant)
2. Morse Taper Shank (#2 and #3)
3. Automotive Shanks Available
4. Override Adapter Available

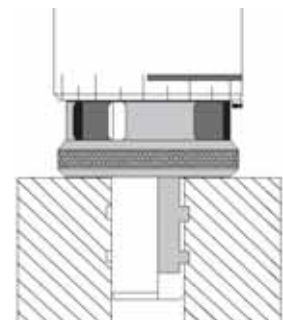
TYPICAL APPLICATIONS



LAND MACHINING HYDRAULIC
SPOOL VALVES
IN ONE PASS



SIMULTANEOUS MACHINING OF
AUTOMOTIVE PISTON
INTERNAL & EXTERNAL FEATURES



TUBE SHEET AND
"O" RING GROOVES

INTERNAL RECESSING UNIT

TOOL SETTING

There are only two settings required on the Elliott IRU tool:

- **Positional Location** of the groove is referenced from the face of the stop-collar and/or nose piece to a qualified land on the part or fixture. This position is accomplished by fine threading the adjustable stop collar. A height gauge is the best way to measure the linear position of the cutter in relation to the stop collar or nose piece.
- **Groove Diameter** on a manual fed machine is accomplished by adjusting the limiting nut on the shank end of the tool. For CNC or power fed machines, this is accomplished by programming. It should be noted that the radial feed-out of the IRU is 2:1. If 0.050mm increase of cut diameter is needed, add 0.050mm to the linear travel. Tool diameter can be measured with a micrometer by actuating the tool to the cutting position. Measure the diameter of the pilot and add 2x the height of the cutter.

FEEDS AND SPEEDS

- Feed rates of 0.080mm to 0.120mm / min mm/rev are typical starting points for most applications. For smaller bore diameters (less than 12mm), decrease the feed rate below 0.080mm mm/rev.
- Surface speed in M/min are equal to those recommended for multi-fluted reamers (the speeds below can be increased up to 3x):

MATERIAL MACHINED

Cast Iron - Gray
Cast Iron - Nodular
Steel / Forgings
Aluminum and Brass

M/MIN

30 to 35m
10 to 15m
15 to 20mm
50 to 55mm

INSTALLING IRU PILOTS AND ARMS



Hold the cutter or the carrier arm with cutter attached at 90° to the leaf spring and insert it into the operating head.



Rotate the cutter 90° degrees so that the yoke of the cutter straddles the pull pin. The leaf spring will come to rest on the pad of the arm as shown.



Align the pilot to the cutter and insert the pilot until the cam surface of the cutter engages the pilot.

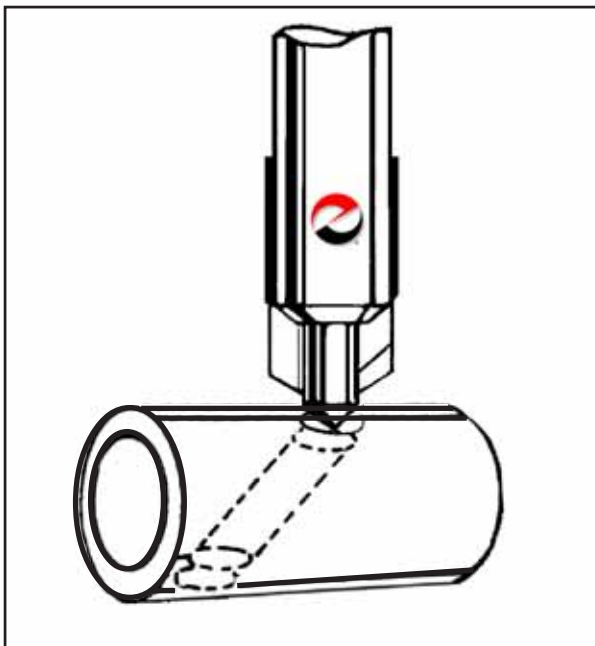


Lock the pilot in place with the screw, as shown. When the adjustment stop collar is in place, this screw is tightened through a slot in the collar.

ELLIPTICAL DEBURRING TOOL



Complete Tool Number	Operating Range		"C" Length	"D" Body	"E" Shank	"F" Degrees
	"A" Min.	"B" Max.				
0430001	04.0 - 08.0mm		80mm	16mm	M10	120
0435001	06.3 - 012.5mm		83mm	19mm	M10	120
0440000	09.5 - 025mm		120mm	25mm	12.7mm	120



FOR CURVED OR ELLIPTICAL SURFACES CREATED IN DRILLING

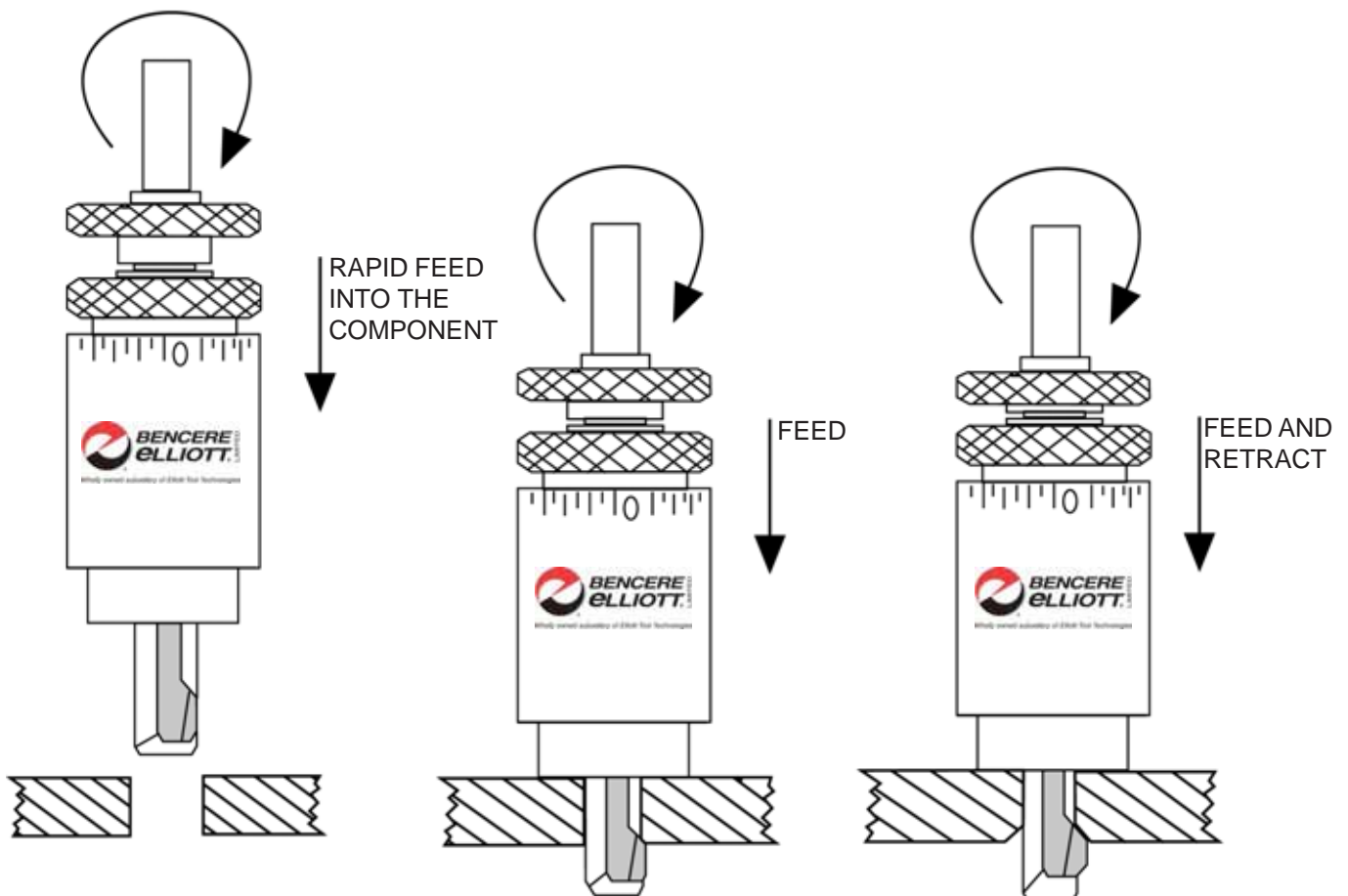
- CHAMFERS HOLE EDGES
- FOLLOWS HOLE CIRCUMFERENCE
- UNIFORM BURR REMOVAL
- REGRINDABLE CUTTERS
- TOOL SIZES 4mm TO 25mm

Part diameter should be at least three times greater than the cross drilled hole.

Use at low speeds on drills, drill presses or automated machines.

BACK CHAMFERING UNIT

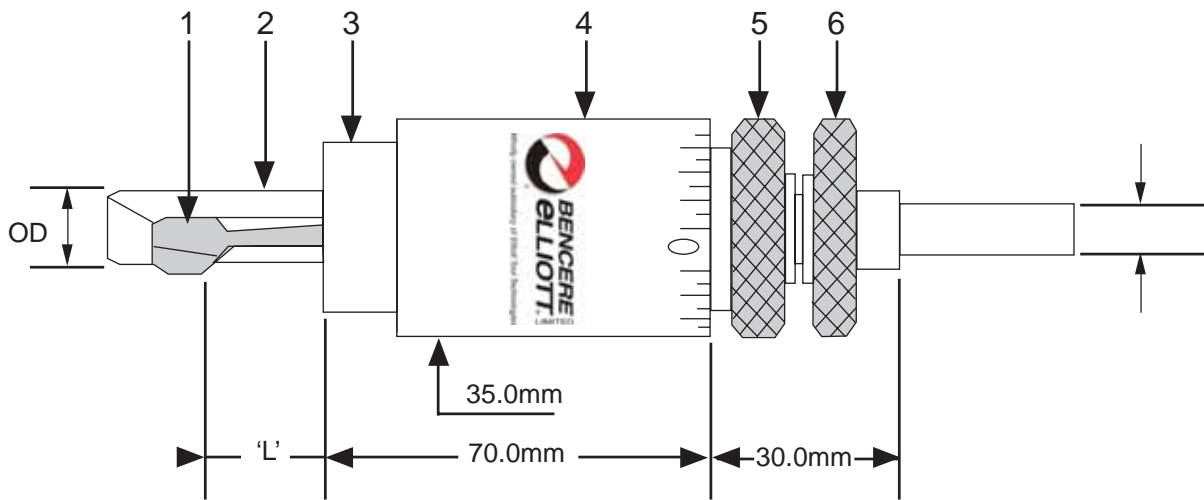
- Fast and easy way to machine precise back chamfers.
- Cycle time measured in seconds, not minutes.
- Positive deburring the rear of a hole from the front face.
- Use on manual drills, special purpose and CNC machines.
- Standard cutters available in M2 high speed steel to machine 45° chamfer. Special chamfer angles and radii quoted on request.
- Standard BCU products chamfer hole diameters from 4.76mm to 20.0mm. Other sizes quoted on request.
- Standard reaches available are 25.4mm and 45mm. Longer lengths quoted on request.



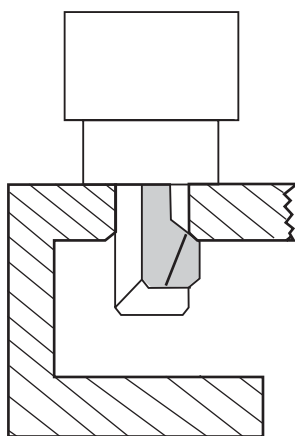
Ordering Information:

Please supply details of the component and the chamfer form required.

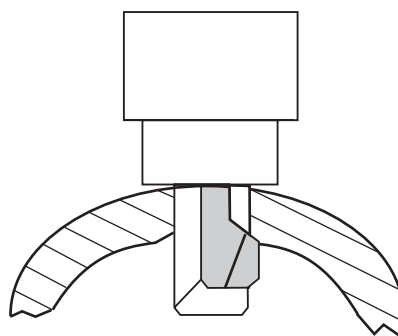
BACK CHAMFERING UNIT



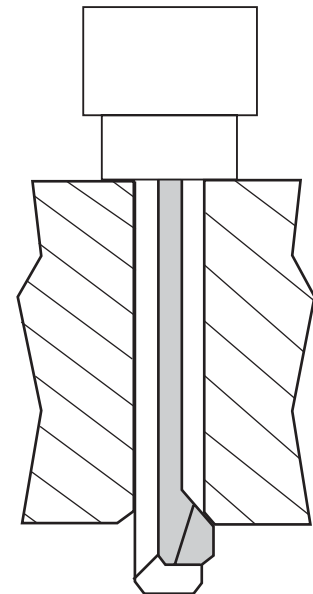
1. Cutter (Produces chamfer to desired angle)
2. Location Pilot (Ground to suit component bore)
3. Bearing Nose Piece (Prevents face damage)
4. BCU Operating Head Bearing Nose Piece (Prevents face damage)
5. Adjustable Collar (Sets chamfer distance from nose piece 'L')
6. Limiting Nut (Set diameter for cutting chamfer)



FLAT OR RESTRICTED FACES



CURVED SURFACES



LONG REACH APPLICATIONS



Wholly owned subsidiary of Elliott Tool Technologies

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ADDITIONAL PRECISION PRODUCTS



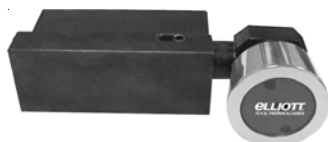
Monaghan I.D. Roller Burnishing Tool

Produces superior finish with precise size control. Easy adjustments in increments of .0001".



Monaghan O.D. Roller Burnishing Tool

Produces superior finish with precise size control. Easy adjustments in increments of .0001".



Outside-Surface Carbide Roller Burnishing Tool

Burnish O.D. surfaces and land faces. Use on any machine where the part is rotating.



Multi-Surface Carbide Roller Burnishing Tool

Designed for CNC Turning Centers to burnish multiple surfaces as well as contours. Available in 12" and 18" overall length.



Diamond Burnishing Tool

Economical way to burnish O.D. surfaces and faces. Produces 2 to 15 microinch finish. Replaceable diamond stems.



Elliott R-Max Reamer & Fine Boring Tools

Obtain exceptionally straight 0.0025mm, round holes 0.0025mm, excellent finish 0.15 - .06 micro and size control of 0.005mm.



R-Max Reamer Setting Fixture

Available in Dial or Electronic Gauges. Our easy-to-zero indicator bases reduce blade setting time. The sliding head, tailstock and center easily, and quickly, adjust for various tool lengths.



Mechanical Joining Tool

Join tubular products to flanges and fittings. The mechanical joint will not leak, pull off or vibrate loose when properly installed. For use on hydraulic or pneumatic applications.

BENCERE ELLIOTT LTD
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Chipping Norton
Oxon OX7 5QL

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