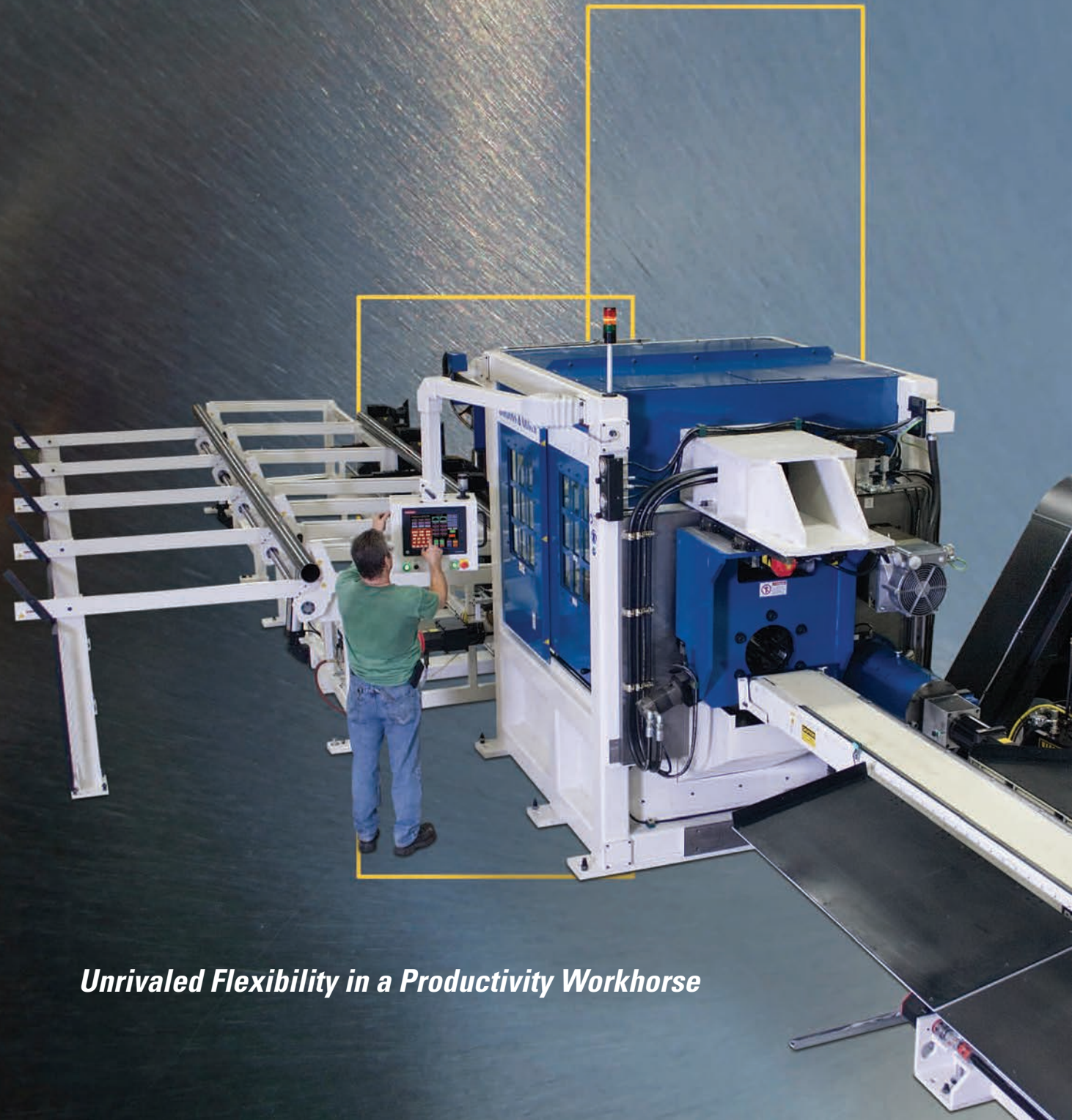


BARDONS & OLIVER

Rotating Head Cut-Off Machines

RH-500 RH-700 RH-900
RH-1100 RH-1300 RH-1600



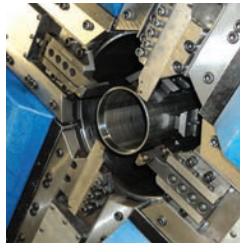
Unrivalled Flexibility in a Productivity Workhorse

The Bardons & Oliver RH Series Rotating Head Cut-Off Machines

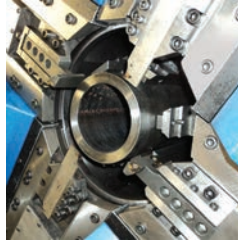
A UNIQUE TUBE AND BAR PROCESSING SYSTEM LIKE NO OTHER

QUICK SET-UP - PROGRAMMABLE SIZE CHANGEOVER

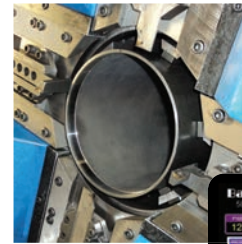
Perform machine set-ups from the Operator Control Panel, or HMI. Even for jobs as varied as the ones shown in the photos below, all adjustments are made as commanded from the HMI. Cutting tool slides, workholding, vises, and material handling are repositioned using digital servos and hydraulics with linear transducer feedback producing incredible flexibility.



4" O.D. x 0.157" wall material. Finished part requires cut-off and 15mm deep counterbores at both ends of part.



5" O.D. x 0.500" wall material. Straight cut-off operation only.



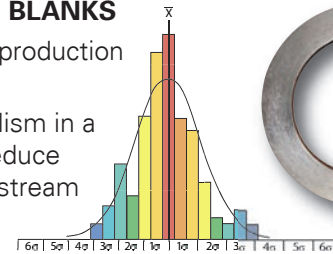
8" O.D. x 0.187" wall material. Finished part requires cut-off and 18mm deep counterbores at both ends of part.

Main Screen



HIGH CAPACITY CUTTING OF PRECISION BLANKS

- Achieve 45-50 sq.in./min. or more on high production heavy-wall tube processing.
- Hold ± 0.005 " length tolerance and parallelism in a strict Cpk environment. Precision blanks reduce machining time and material loss on downstream finishing operations.



WHY A ROTATING HEAD?

Unlike conventional cut-off lathes, Bardons & Oliver Rotating Head Cut-Off Machines **hold the material stationary while the cutting tools rotate**. This brings the unique advantage of lathe style cut-off to a broader range of applications than was previously possible. Now difficult-to-process material such as irregular tubes and bars can be processed more efficiently than with saws with Bardons & Oliver Rotating Head Cut-Off Machines.

Bardons & Oliver Rotating Head Cut-Off Machines:

- Allow processing of hot rolled or irregular tubes.
- Eliminate marking of tube O.D. Maintain tube O.D. cosmetics.
- Perform 4th corner chamfering - I.D. operations on back side of finished workpiece.
- Cut only the tube wall, unlike a saw that "recuts" hardened chips and shavings that collect in tube I.D.
- Maintain more precise length accuracy and parallelism of finished part faces.
- Perform end finishing operations without expensive secondary equipment.

RAW MATERIAL TO FINISHED PARTS IN ONE OPERATION

End finishing capability without the expense of secondary equipment, dedicated tooling, and long complicated set-ups.

Complete the 4th Corner. The rotating head cut-off machine has the unique capability to chamfer and counterbore the I.D. and the O.D. of both ends of the workpiece. Other machines like band saws, cold saws and traditional cut-off lathes require expensive secondary machines to complete parts with these features.

The operator can specify a wide range of part end conditions by accessing the Part Editing Screen within the HMI. Simply select an existing program or fill in the blanks to create a new program.

The screenshot displays the 'PART EDITING SCREEN' with the following fields and controls:

- Top Bar:** PAGE # 123, LINE # 123, RECORD # 123. Buttons: SAVE DATA, ADD NEW, MACHINE, BARFEED, PARAM, PART PROGS, JOB SETUP, MANT, FAULTS, FLT HISTORY.
- PARAMETERS:**
 - CUTOFF PARAMETERS: # OF TOOLS #, FEEDRATE #, M.P.M. #
 - PART NAME OR #: [Blank]
 - PART DUMP: #####
- Diagram:** A schematic of a cylindrical part with dimensions: MATERIAL O.D. (###), WALL THICKNESS (##), COUNTERBORE ON/OFF (##), COUNTERBORE DIAMETER (###), COUNTERBORE FEEDRATE (###), COUNTERBORE M.P.M. (###), PART LENGTH (###), COUNTERBORE DEPTH (##).
- CHAMFER SETTINGS:**
 - OD CHAMFER DEPTH (##), OD CHAMFER ON/OFF (##), OD CHAMFER FEEDRATE (##), OD CHAMFER M.P.M. (##)
 - ID CHAMFER DEPTH (##), ID CHAMFER ON/OFF (##), ID CHAMFER FEEDRATE (##), ID CHAMFER M.P.M. (##)

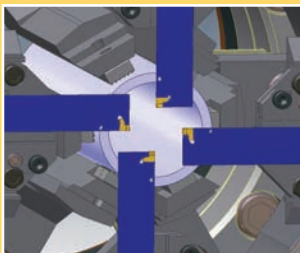
- O.D. chamfers
- I.D. chamfers
- O.D. and I.D. chamfers in combination
- I.D. counterbores
- "J" grooves and weld preps with appropriate software
- Bevels
- O.D. steps or shoulders
- Face grooves or tree panning

**Parts finished in one operation.
Work in process eliminated.
Inventory reduced.**

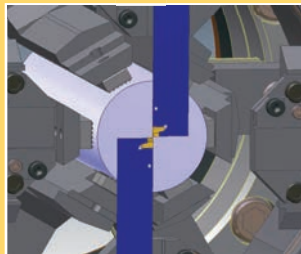
From the machine's Part Editing Screen, the operator can load all finished workpiece information. This can include counterbores, O.D. chamfers and I.D. chamfers. Also, as seen in the center section of the screen, both ends of the part can be processed in one operation.



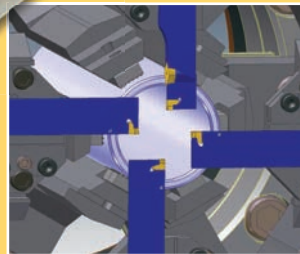
How It Works



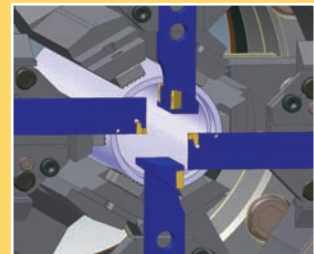
For straight cutting jobs without O.D. chamfers, mount cut-off tools at all four slide positions.



For cutting smaller tubing or solid bar, mount two cut-off tools on opposing slides.



To cut workpieces complete with O.D. and/or I.D. chamfers on both ends of the part, mount cut-off tools on all four slides including the Bardons & Oliver combination cut-off/chamfer tool in one position.



To counterbore I.D. of one or both ends of the finished workpiece, mount cut-off tools on opposing slides and counterbore tools on two remaining slides.



GENERATE COMPLEX PART END CONFIGURATIONS

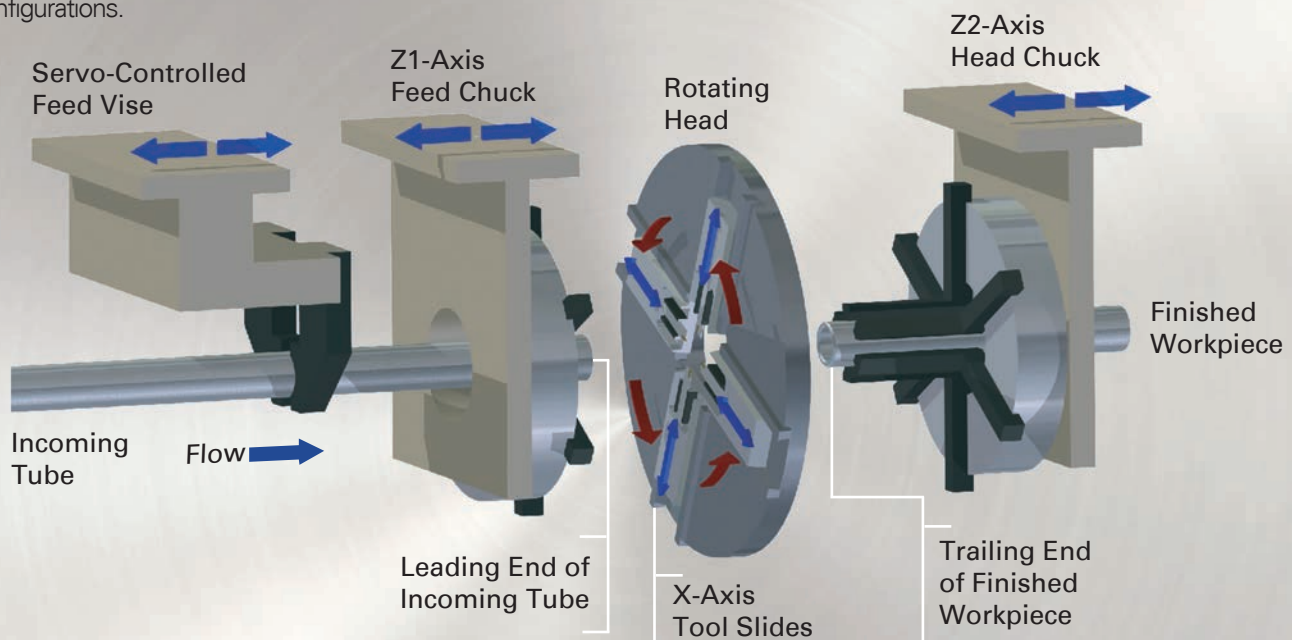
Perform operations on the O.D. and I.D. of parts made from tube stock **on both ends in one operation**. The Bardons & Oliver rotating head cut-off machine has three servo controlled axes to give the operator full control over the finished workpiece plus a servo controlled feed vise for precise length control and continuous tube feed out - no hitch feeding.

- **X-Axis - Tool Slides.** Precise control of tools for cut-off, O.D. chamfer or I.D. chamfer operations.
- **Z1-Axis - Feed Chuck.** Holds incoming tube for processing of leading edge. Can reposition tube to allow for tool clearance for special I.D. tools. Can feed tube (Z1-minus) to generate counterbores, face grooves, and other complex configurations.

- **Z2-Axis - Head Chuck.** Holds that portion of the tube that becomes the finished workpiece. ***Continues to hold the finished workpiece in position after the cut-off operation.*** Can reposition tube to allow for tool clearance for special I.D. tools. Can feed finished workpiece (Z1-minus) to generate counterbores, face grooves, and other complex configurations on trailing end of part.
- **Servo-Controlled Feed Vise.** Precise length control of finished workpiece. Continuous feed out of tube regardless of length without hitch feeding.

Work in process eliminated.

Inventory reduced.



LEAN MANUFACTURING ACHIEVED. TAKT TIME REALIZED.

Run the parts your customers need. . .when they need them. . .how they need them.

Single part production



Cut parts in sequence to produce a kit of parts



Cut long parts from one tube, cut remnant into usable short parts



Nesting: cut any combination of part lengths on the fly



TEN STANDARD INTERFACE SCREENS GIVE THE OPERATOR COMPLETE PROCESS CONTROL THROUGH THE OPERATOR CONTROL PANEL, OR HMI

Main Screen (Figure A) controls all basic functions required during automatic operation.

Machine Screen and Barfeed Screen (Figure B) allows manual control of virtually every machine function plus the input of key machine variables.

Tool Set-up Screen guides the operator through the job set-up sequence and automatically generates tool offsets.

Job Set-up Screen (Figure C) allows the operator to enter information for up to six parts that can be run simultaneously from the same material.

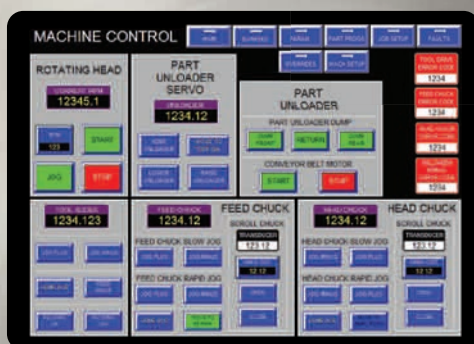
Set-up Parameter Screen guides the operator or process engineer through the setting of key machine operating parameters.

Part Editing Screen (Figure D) and **Master Database Screen (Figure E)** allow for the creation, editing, and storing of data for up to 200 part numbers.

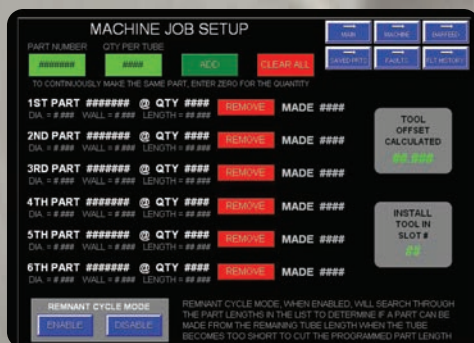
Maintenance Screen and Fault Screen allow the monitoring of machine and handling table inputs and faults. **Fault History** screen keeps a record of recent faults and cannot be deleted.



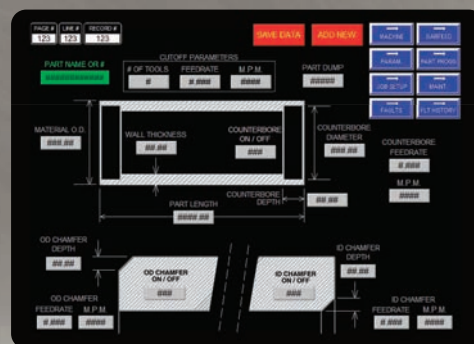
A



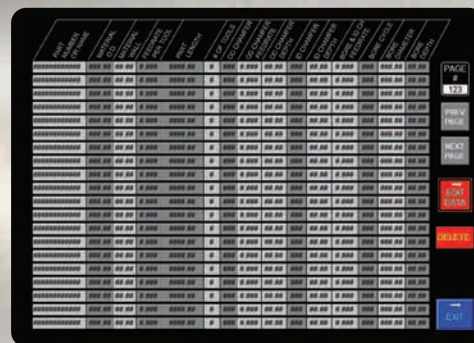
B



C



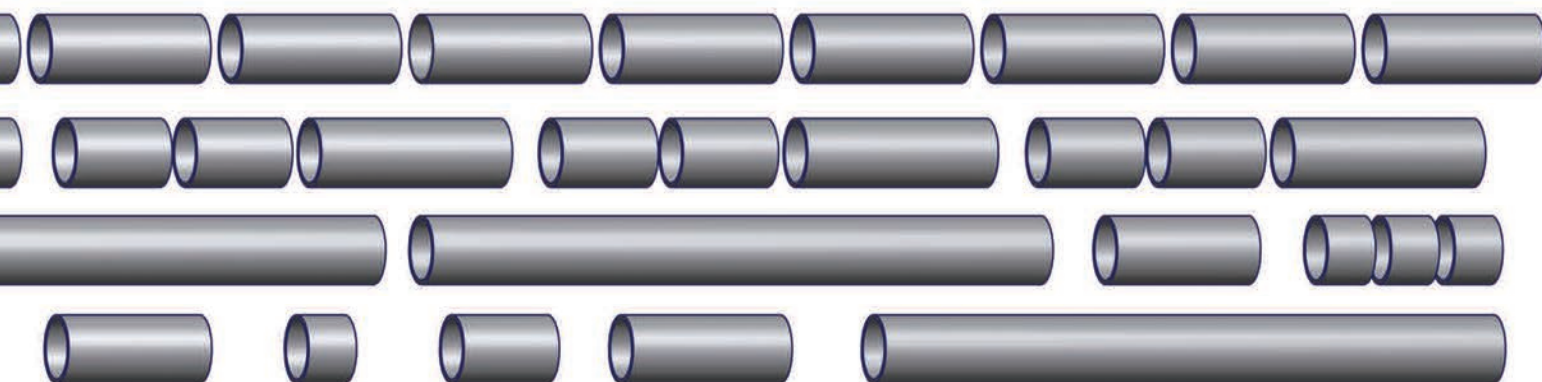
D



E



With a part program storage capacity of over 200 part numbers and the ability to create a job sequence of six programs, the Bardons & Oliver Rotating Head Cut-Off Machine truly delivers.

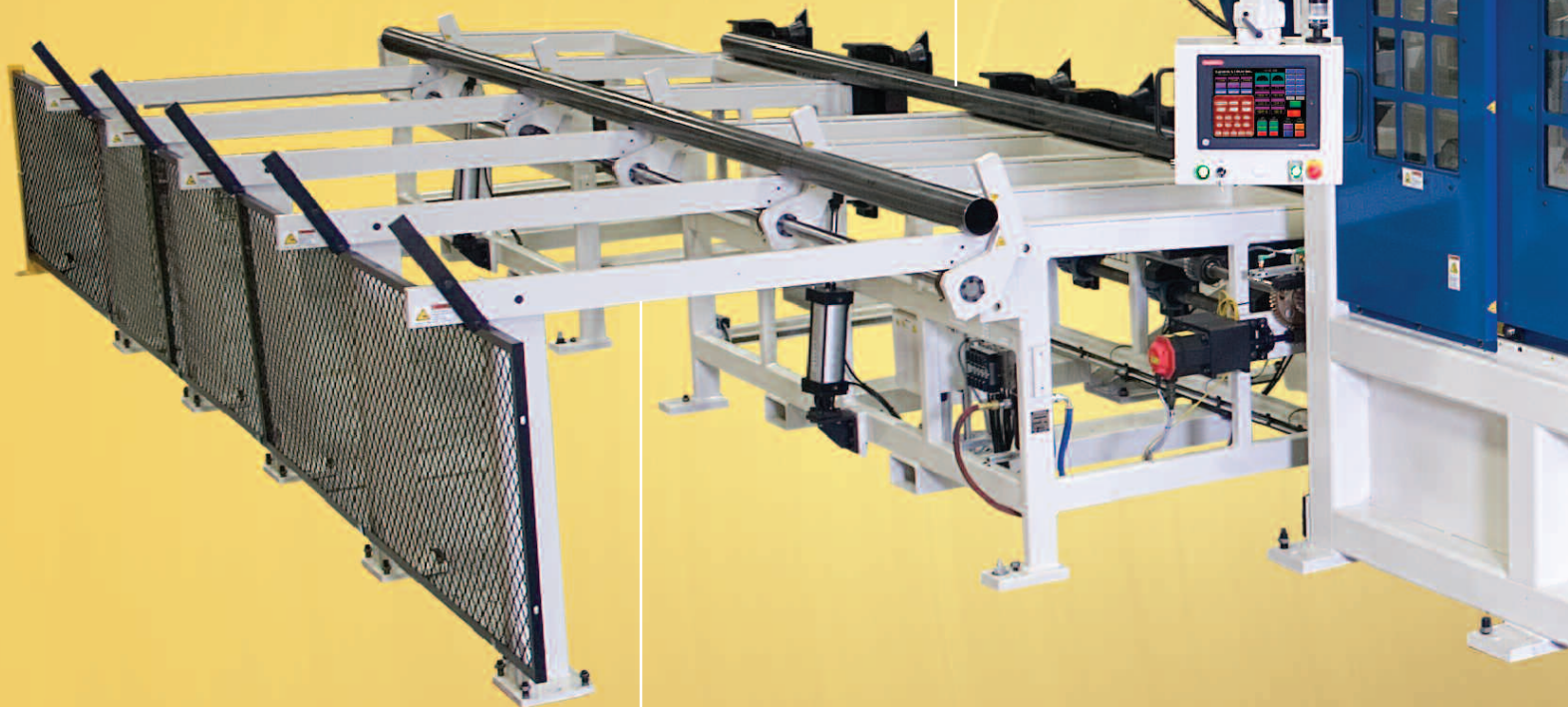


ROTATING HEAD CUT-OFF SERIES



ZERO SET-UP TIME FOR LOADING TABLE

- No lost production time for material O.D. adjustment
- Full range of travel on V-Rolls, Kickouts, and Tube Stops (optional) controlled from HMI
- Instant size changeover



STAGE INCOMING MATERIAL WITH ZERO LOST PRODUCTION TIME

- Load additional material on 50" inlet table without interrupting machine cycle
- Optional table extensions with stop gates (*shown*) allow staging of next job
- Optional loading bucks provide safe and efficient handling of tube bundles



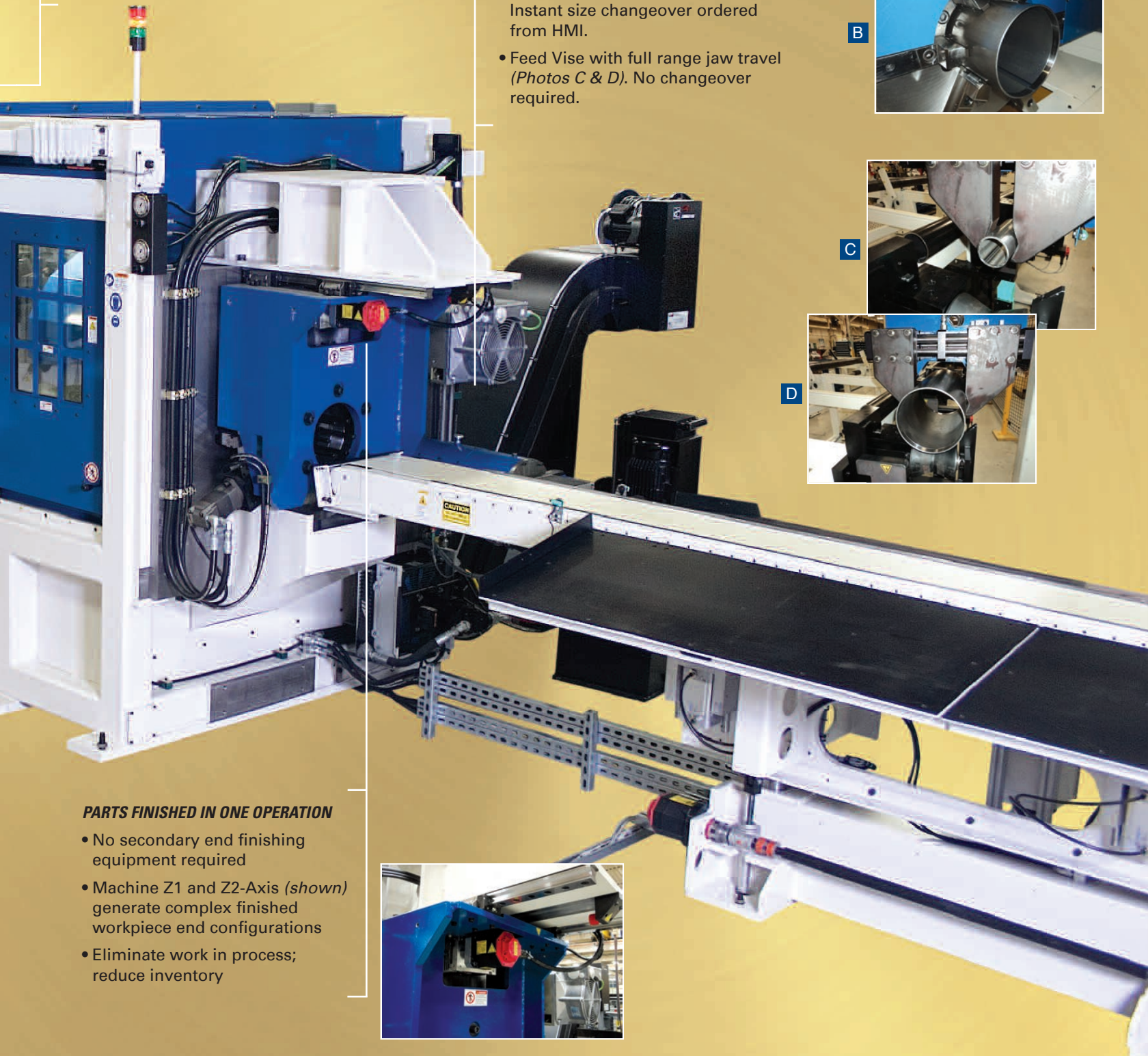
FROM START TO FINISH, THE BARDONS & OLIVER RH SERIES

QUICKER MOVEMENT OF TUBES - FASTER CYCLE TIMES ON LONG PARTS

- Servo actuated rack and pinion driven Feed Vise
- 10' continuous stroke standard - **No Hitch Feeding**
- Precision part length held to +/- 0.005"
- Allows next tube loading while current tube is still processing

ZERO SET-UP TIME FOR WORKHOLDING

- There is no lost production time for material size adjustment.
- Two 6 jaw long stroke chucks (Photos A & B). Hydraulic servo, linear transducer feedback. One chuck holds incoming material, one holds finished workpiece. Instant size changeover ordered from HMI.
- Feed Vise with full range jaw travel (Photos C & D). No changeover required.



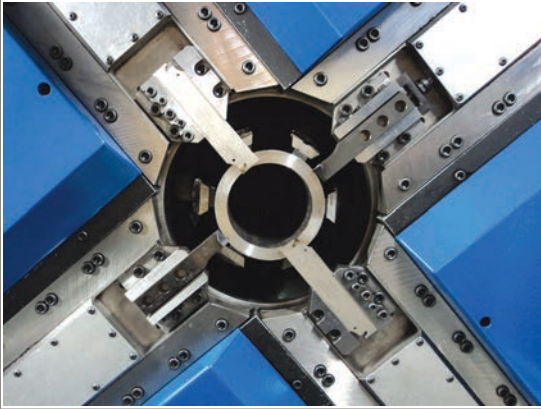
PARTS FINISHED IN ONE OPERATION

- No secondary end finishing equipment required
- Machine Z1 and Z2-Axis (shown) generate complex finished workpiece end configurations
- Eliminate work in process; reduce inventory



S CUT-OFF MACHINE IS A MODEL OF PRODUCTIVITY AND EFFICIENCY

KEY FEATURES OF THE RH SERIES

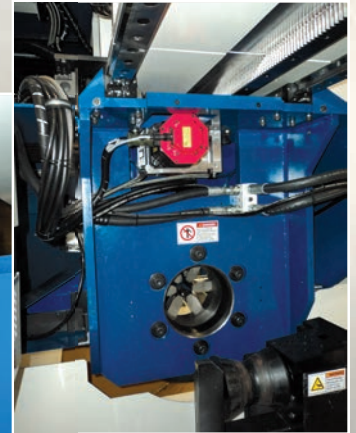
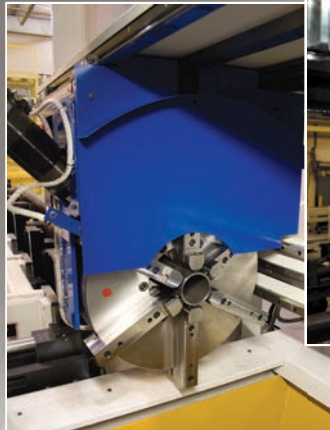


ROTATING HEAD

- Four precision built hardened 8620 steel cut-off slides with hardened tool steel guides and bases mounted on the rotating head
- Long travel accommodates a wide range of material sizes without resetting tools
- Tools may be added to cut O.D. chamfers
- Slides actuated via rack and pinion with servo driven feedbox

PRECISION END FINISHING OF WORKPIECE

- Rigidly mounted Workholding and Carriages firmly hold incoming tube and finished workpieces during machining
- Servo driven rack and pinion provides fast and accurate Z1 and Z2-Axis motion
- Z1 and Z2-Axis carriages ride on #45 rails and sliders



MIST COOLANT SYSTEM (optional)

- Extends tool life
- Allows increased cutting rate
- Improves surface finish
- Requires less maintenance than flood coolant system

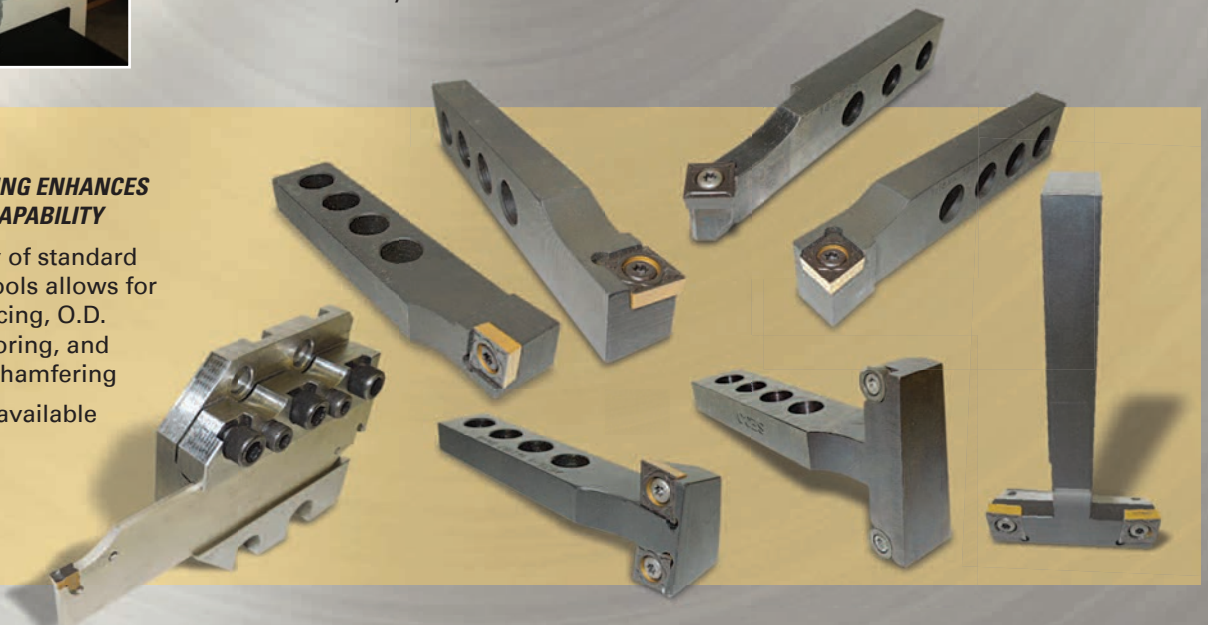


CENTRAL LUBRICATION SYSTEM

- Delivers positive lubrication to critical machine elements

AVAILABLE TOOLING ENHANCES END FINISHING CAPABILITY

- A wide variety of standard off-the-shelf tools allows for cut-off, end facing, O.D. turning, I.D. boring, and O.D. and I.D. chamfering
- Custom tools available

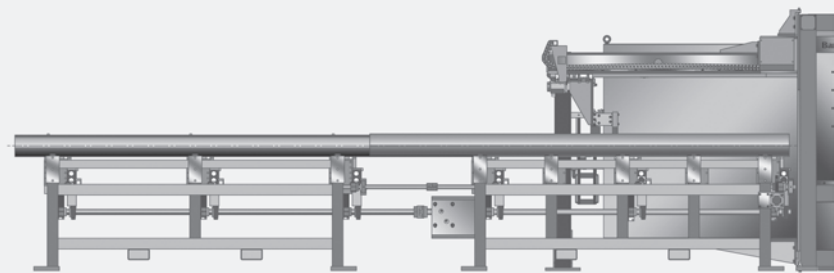
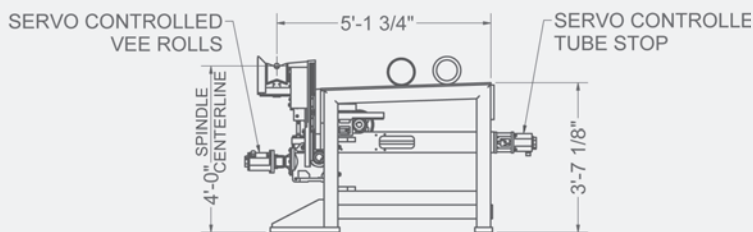
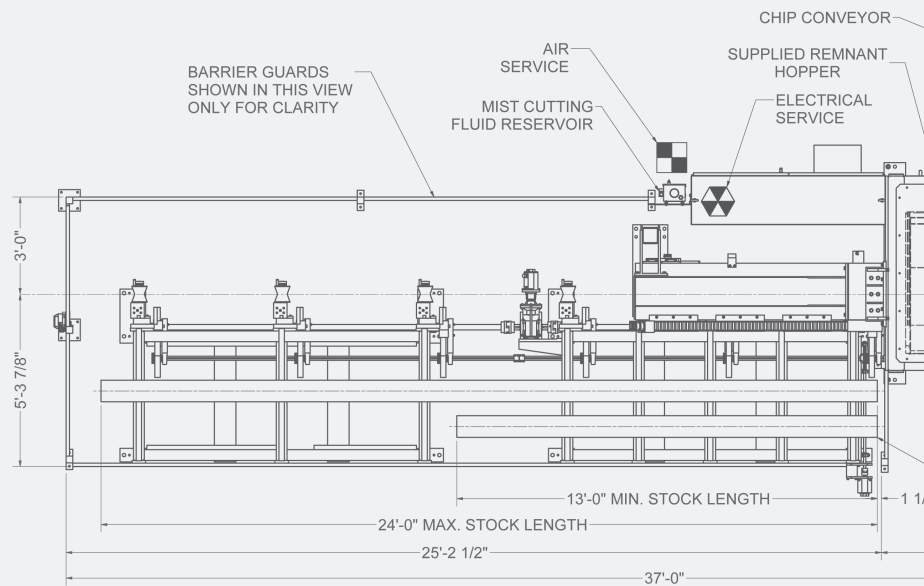


BARDONS & OLIVER RH SERIES CUT-OFF MACHINE SPECIFICATIONS

		RH-500	RH-700	RH-900	RH-1100	RH-1300	RH-1600
MATERIAL TO BE PROCESSED							
Maximum Outside Diameter	inch/mm	5.00 / 127.0	7.00 / 177.8	9.00 / 228.6	11.00 / 279.4	13.00 / 330.2	16.00 / 406.4
Minimum Outside Diameter	inch/mm	0.75 / 19.0	1.00 / 25.4	2.50 / 63.5	3.00 / 76.2	3.00 / 76.2	6.00 / 152.4
Maximum Wall Thickness	inch/mm	1.00 / 25.4	1.00 / 25.4	1.25 / 31.7	1.25 / 31.7	1.25 / 31.7	1.25 / 31.7
Minimum Wall Thickness	inch/mm	0.06 / 1.52	0.06 / 1.52	0.06 / 1.52	0.09 / 2.36	0.09 / 2.36	0.09 / 2.36
FINISHED PART							
Minimum Part Length	inch/mm	2.25 / 57.1*	2.25 / 57.1*	2.25 / 57.1*	2.25 / 57.1*	2.25 / 57.1*	2.25 / 57.1*
Maximum Part Length		Unloader Length Dependent On Customer Specification					
MACHINE FEATURES							
Cut-Off Slides (Std)		4 Slides Synchronized					
Slide Travel - Per Slide	inch/mm	3.50 / 88.9	4.50 / 114.3	5.0 / 127.0	6.00 / 152.4	6.00 / 152.4	6.00 / 152.4
Machine Control		Fanuc 35iB					
Air Conditioner - Electrical Enclosure		4000 BTU					
Spindle Drive System		Fanuc A22			Fanuc A40		
Spindle Horsepower		30 hp / 22 kw Continuous (60 min Rating)			50 hp / 36 kw Continuous (60 min Rating)		
Spindle Speed Range	rev/min	10-1000	10-1000	10-750	10-500	10-400	10-300
Mist Coolant - Cutting Tool Lubrication System		AMCOL Model 6000					
Central Lubrication System		• Bijur "Surefire"					
		• Feed Chuck • Head Chuck					
		• 7 1/2 hp 20 gpm @1000 psi					
		• 30 Gal Capacity					
		• Mobil DTE 24 Recommended					
Hydraulic System							
DRIVE SPECIFICATIONS							
X-Axis - Slide Control		FANUC Beta 8/3000HVis AC Digital Servo					
Controls feeding and positioning of cut-off blades		Belt Driven Rack and Pinion via Servo Driven Synchronous Oil Cooled Feedbox					
OD & ID chamfer tools, and boring tools		9.5 gpm 15,000 btu/hr Cooling Capacity					
ZA-Axis - Feed Chuck		FANUC Beta 8/3000HVis AC Digital Servo					
Controls movement for O.D. & I.D. chamfering and boring		Driven via Rack and Pinion					
ZB-Axis - Head Chuck		FANUC Beta 8/3000HVis AC Digital Servo					
Controls movement for O.D. & I.D. chamfering and boring		Driven via Rack and Pinion					
ZC-Axis - Feed Vise		FANUC Beta 8/3000HVis AC Digital Servo					
Controls movement of incoming tube and finished part length		Driven via Rack and Pinion					
Feed Rate - Maximum							
X-Axis	in/min / mm/min	118 / 3000	118 / 3000	118 / 3000	118 / 3000	118 / 3000	118 / 3000
ZA-Axis	in/min / mm/min	118 / 3000	118 / 3000	118 / 3000	118 / 3000	118 / 3000	118 / 3000
ZB-Axis	in/min / mm/min	118 / 3000	118 / 3000	118 / 3000	118 / 3000	118 / 3000	118 / 3000
Rapid Rate - Maximum							
X-Axis	in/min / mm/min	400 / 10160	400 / 10160	400 / 10160	400 / 10160	400 / 10160	400 / 10160
ZA-Axis	in/min / mm/min	800 / 20320	800 / 20320	800 / 20320	800 / 20320	800 / 20320	800 / 20320
ZB-Axis	in/min / mm/min	800 / 20320	800 / 20320	800 / 20320	800 / 20320	800 / 20320	800 / 20320
ZC-Axis	in/min / mm/min	800 / 20320	800 / 20320	800 / 20320	800 / 20320	800 / 20320	800 / 20320
Thrust - Maximum							
X-Axis @ 0 rpm's	lb/kg	6000 / 2722	6000 / 2722	6000 / 2722	6000 / 2722	6000 / 2722	6000 / 2722
X-Axis @ Max rpm's	lb/kg	2500 / 1134	2500 / 1134	2500 / 1134	2500 / 1134	2500 / 1134	2500 / 1134
ZA-Axis	lb/kg	1424 / 646	1424 / 646	1424 / 646	1424 / 646	1424 / 646	1424 / 646
ZB-Axis	lb/kg	1424 / 646	1424 / 646	1424 / 646	1424 / 646	1424 / 646	1424 / 646
ZC-Axis	lb/kg	520 / 236	520 / 236	520 / 236	520 / 236	1040 / 472	1040 / 472
MACHINE WORKHOLDING							
Feed Chuck		• Heavy Duty 6-Jaw Gear Scroll Chuck					
		• Hydraulic Motor Actuation • Full Range Capacity					
		• Linear Transducer Feedback • Automatic Lubrication					
Head Chuck		• Heavy Duty 6-Jaw Gear Scroll Chuck					
		• Hydraulic Motor Actuation • Full Range Capacity					
		• Linear Transducer Feedback • Automatic Lubrication					
Feed Vise		• Pneumatically/Hydraulically Actuated					
		• Full Range capacity					
TUBE LOADING SYSTEM - Std 24 ft							
Incoming Material Maximum Length	ft/m	50 / 15.2 Consult Factory for longer lengths.					
Incoming Material Minimum Length	ft/m	10 / 3					
Maximum Material Weight per Length	lb/ft / kg/m	85 / 126.7	85 / 126.7	85 / 126.7	110 / 163.9	130 / 193.7	160 / 238.4
Inlet Skid Width	in/mm	50 / 1270					
Tube Support		Servo Height Adjusted Vee Rolls for Tube O.D. Change Over					
ELECTRICAL POWER & CAPACITIES							
Electrical Power		460 vac, 3 phase, 60 hz, 50 kva			460 vac, 3 phase, 60 hz, 67 kva		
Main Breaker		100 amp	100 amp	100 amp	150 amp	150 amp	150 amp
Pneumatic Requirements		6 scfm @ 80 psi			8 scfm @ 80 psi		
Hydraulic Reservoir Capacity	Gal/L	30 / 114					
Mist Coolant System Capacity	Gal/L	2.5 / 9.5					
Central Lubrication System Capacity	Gal/L	0.5 / 1.9					
SIZE & WEIGHT, 24' Loader, 10' Unloader							
Machine Height	in/mm	100 / 2540				102.0 / 2598	
Floor Space Requirements (Width x Length)	in/mm	612 x 186 / 15545 x 4725				consult factory	
Machine Weight – lb/kg (Heaviest piece)		22,800 / 10,342	23,000 / 10,433		23,500 / 10,660	consult factory	

*With special jaws and machine setup, shorter lengths are possible.

ENGINEERING SPECIFICATIONS



AUTOMATION THROUGH INTEGRATION

Let the Bardons & Oliver factory automation specialists turn your Rotating Head Cut-Off Machine into a manufacturing system by integrating any of these material handling enhancements:

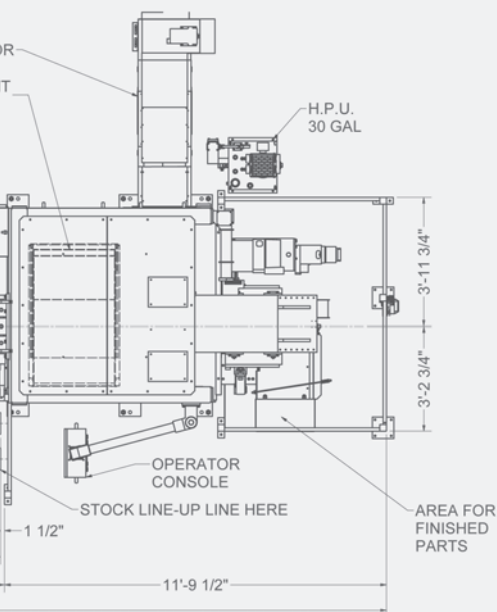


UNLOADER CONFIGURATIONS FOR EVERY REQUIREMENT

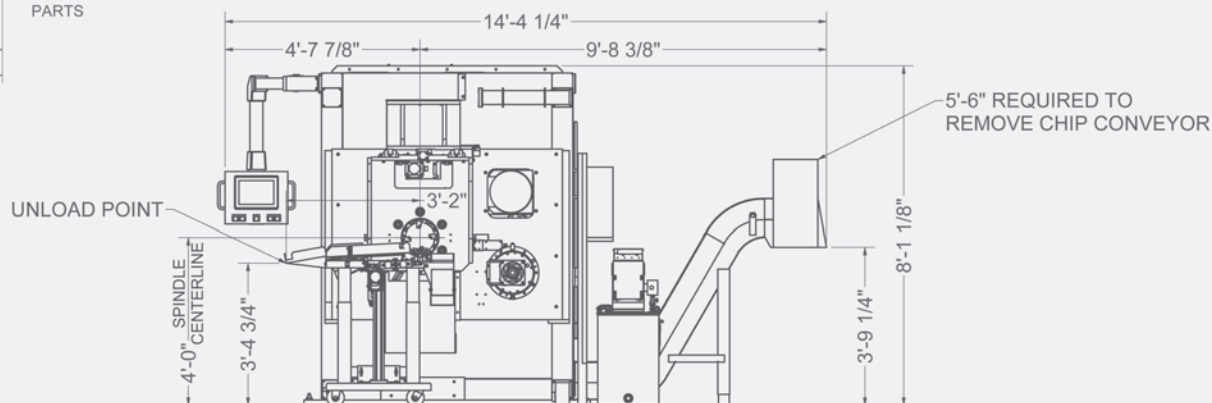
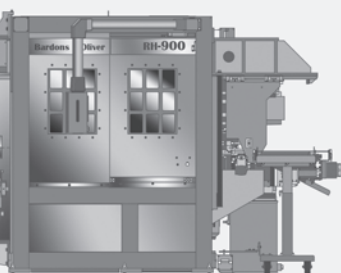
- Ring style and short part pick-off unloaders for high production blanking operations
- Pick-off unloaders for parts up to 12" long
- May be combined with any configuration long part unload system



- Long part unloader – length per customer specifications
- May be combined with short part pick-off
- Finished part discharge toward operator or towards back of machine
- Separate remnant and crop disposal



System shown is Model RH-900 Rotating Head Cut-Off Machine with standard 24' loader, short part unloader, optional chip conveyor and optional servo-controlled tube stops. Numerous configurations and options are available to meet specific customer requirements.



BUCK STYLE UNLOADER

- Provides efficient means for collecting finished tubes
- Allows for tubes to be lowered into customer's pallet
- Available end justification and 60-degree forms for banding
- Unloader includes part staging area to allow continued cutting while collected parts are removed from bucks



ROBOT

- Relieves machine operator of heavy lifting and/or tedious material handling operations
- System can include part justification for proper lifting
- Robot control seamlessly interfaces to machine control
- Robot with optional vision system "finds" part on exit conveyor, identifies it, and places it in appropriate container

Please visit our website to learn more about Bardons & Oliver Tube & Bar Processing Machines, CNC Turning Machines, System Automation, and Robotics Integration. You'll find videos, downloadable literature, technical information and more.

BARDONS & OLIVER



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