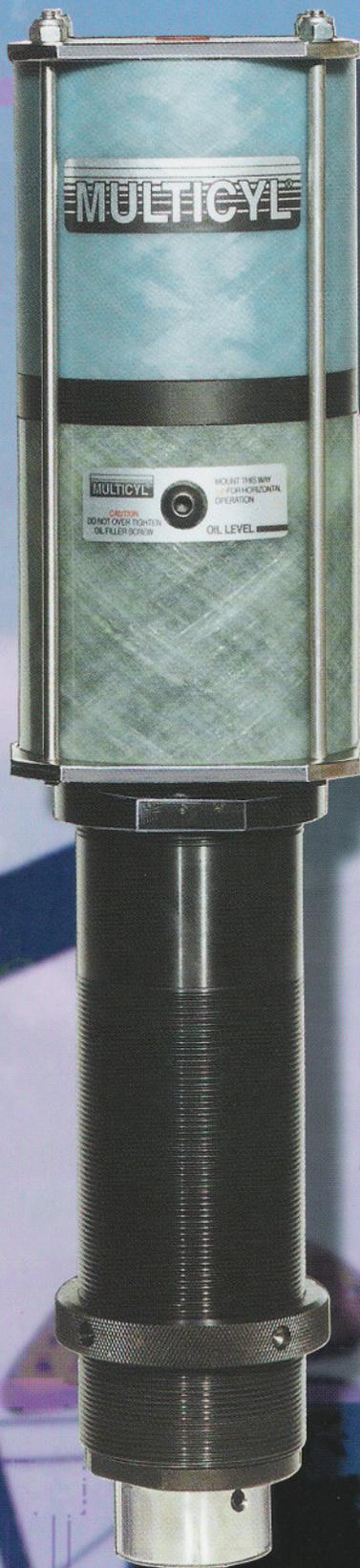


MULTICYL®

AIR OVER OIL
+
IMAGINEERING
=
MULTICYL



FOR SOME COOL PUNCHING IDEA CHECK OUT OUR WEB SITE : [HTTP://WWW.MULTICYL.COM](http://www.multicyl.com)

AIR OVER OIL

POWER TO PUNCH WITH

MULTICYL®

IMAGINEERING INDEX

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MULTICYL IS SAFE TO USE

With the tool open height reduced to the O.S.H.A. (Federal Occupational Safety and Health Act) approved heights no external safety guard is required. Simply adjust the Multicyl - to the right height and it will self adjust to "bottom out" and eliminate any nip points. This jam-proof action protects tool from breakage - a big plus in assembly or riveting operations that require consistent force requirements. Minimum air consumption permits the use of small, flexible air hose sizes instead of high-pressure hydraulic hoses. All high-pressure chambers are safely within the structure; translucent reservoir maintains constant atmospheric pressure, thereby posing no safety hazard to user.

SAFETY AIR CONTROL PACKAGE

Controls for hole punching applications in flat sheet metal can usually meet all O.S.H.A. safety standards as the self-adjusting stroke can be set to a height where there is no operator nip point. However in applications where the tool open height goes beyond the approved safety limit a Two Hand Anti-Tie Down Circuit is recommended.

For example, in tube piercing, front feeding of the tube involves opening the tube guides presenting a hazard, either a two hand control may be used or alternatively an external safety guard may be employed with a foot valve as long as the application is safe.

O.S.H.A.'s Mechanical Power Press Safety Regulations Section 1910.217 (c) : Methods of Safeguarding the Point of Operation, states that :

(i) It shall be the responsibility of the employer to provide and insure the usage of the point of operation guards or properly adjusted point of operation devices on every operation performed on a mechanical power press.

(ii) The requirements of subdivision (i) of this subparagraph shall not apply when the point of operation opening is one-fourth inch or less.



Combine Multicyl with standard tooling and an alternative to a conventional press is created for a fraction of the cost

THE IDEA THAT CHANGED THE PRESS INDUSTRY

The concept of an air powered device to punch holes in metal was the catalyst for developing Multicyl. It took several years to perfect a simple but powerful air oil combination which was easy to use. The patented design can revolutionize the way that sheet metal parts are made by amalgamating several operations in one area. The workcell concept has been embraced as a well proven cost saver in the industry.

Original uses have been expanded to include many press applications such as assembly and tube fabrication. Multicyl is now used as a power source in industries such as automotive, appliance, aircraft, business equipment, vending machines and furniture manufacturing. The convenience of Multicyl now replaces conventional machine tools in over 25 countries around the world.

WHAT IS MULTICYL?

Multicyl is a patented air over oil press used for punching applications. Uses now include everything from a simple workstation to a completely automated manufacturing cell.

Customers include almost anyone who has a product to make, from IBM or General Motors to the inventive individual working on his first project.

Its small size and portable feature is good for either bench mounted or movable applications. Quiet, safe and affordable... applications are limited only by the imagination of the user.

SELECTING A MULTICYL

The two main considerations for selecting Multicyl are stroke and tonnage. Multicyl output is proportionate, i.e. 4 tons @ 40 psi (minimum operating pressure) input, 8 tons @ 80 psi, 12 tons @ 120 psi (maximum). Single acting cyls are designed to act like a hammer on guided tooling. Double acting cyls provide a lifting force on the return stroke. Allow 25% safety capacity for variations in air pressure, tool and material conditions.

MULTICYL... THE TOOLMAKER'S TOOL

Take a standard production tool; combine it with our power source and add some IMAGINEERING to produce innovative tool stations.

We put together complete packages containing tools made by such suppliers as :

- Hole Punching and Notching Stripit, Unittool, Unipunch, Pierce All, in Europe Supra, and Redman.
- Tube Notching and Piercing Vogel, Project Tool.
- MultiLoc Clinching tools by BTM Corporation.

Precision tool systems for many varied applications may be incorporated into your custom Multicyl workcell.

"AIR OVER OIL HAS BEEN AROUND FOR A LONG TIME... WE JUST DID SOME IMAGINEERING"

HOW IT WORKS



IS IT IMPORTANT TO KNOW HOW MULTICYCL WORKS?

Not really. Our patented design is like a car engine, internally it is quite complicated but to the user it's very simple. You just put air in one end using a simple air valve and then you get hydraulic power out of the other end of the cylinder.



WHAT IS THE PATENTED PRINCIPLE?

Known as the "flow by" principle it allows the two-stage pressure intensifier to self-adjust anywhere on the overall stroke. This means that the cylinder will stall when it meets resistance greater than the force on the advance stroke.



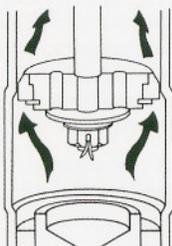
WHAT'S THE BENEFIT OF A TWO STAGE, SELF ADJUSTING STROKE?

For the user there are several benefits: simple air controls; lower air consumption as the power is only produced when you need it. Also that there is no need to set the tooling to a precise height (as would be necessary in a mechanical press) as the hydraulic action simply "bottoms out" wherever resistance is greater.



WHAT HAPPENS INSIDE THE CYLINDER DURING THE "FLOW-BY" ACTION?

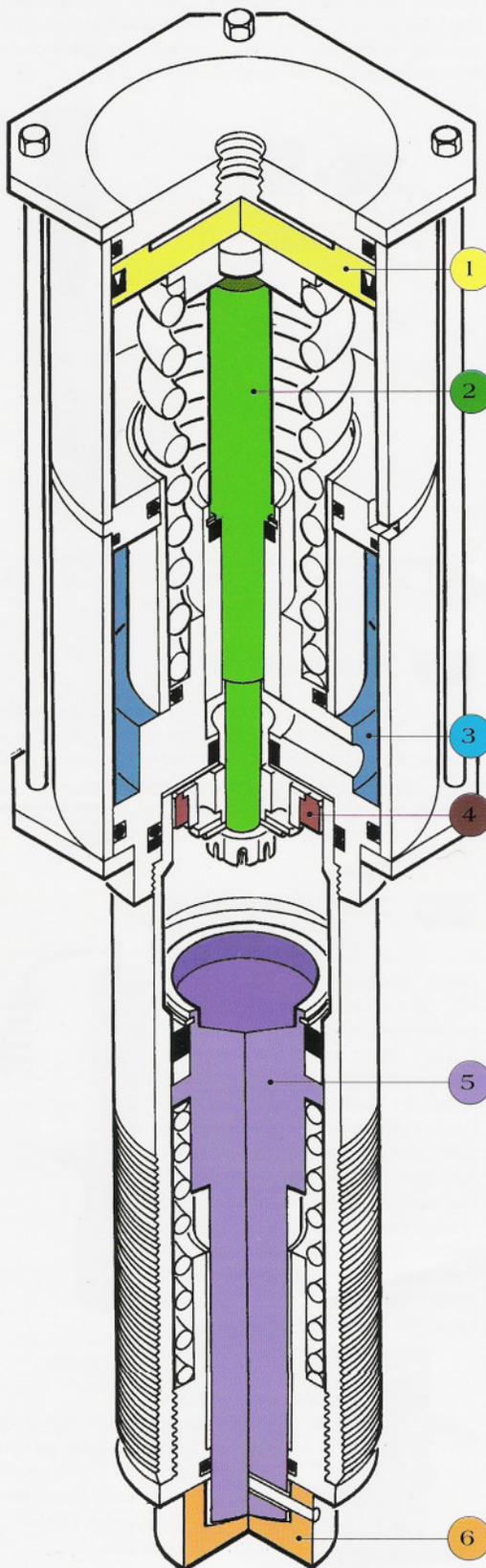
The ram advances using the "dashpot" principle until it meets resistance. Entrapped oil begins to "flow by" the low pressure piston by means of precisely controlled clearances as the piston rod is allowed to continue.



SPHERICAL PIVOT POINT (MC & XL SERIES)

The ram piston and striker cap have a spherical pivot point designed to prevent internal side loading. This feature reduces internal wear on seals and bearings and compensates for out of parallel tool conditions. A roll pin allows the striker cap to float and is designed to shear in extreme conditions. Small tools may be mounted upon the end of the spring returned ram piston.

1	Air Piston
2	HP Piston Rod
3	Oil Reservoir
4	LP Piston
5	Ram Piston
6	Striker Cap



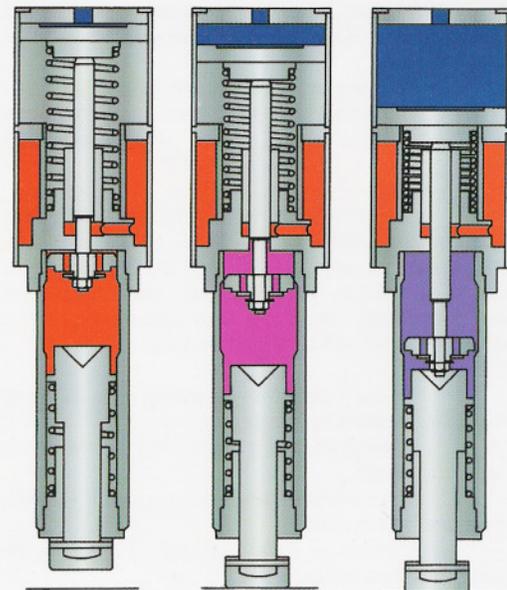
THE "FLOW-BY" SELF ADJUSTING STROKE

Low-pressure (LP) advance stroke. As air pressure is applied to the air piston the HP piston assembly advances. The LP piston valve immediately closes and the ram continues to advance in a full linear fashion until resistance is encountered. Thereupon LP stroke is dissipated by the hydraulic "flow by" principle which permits the air cylinder to continue its advance while the ram remains stationary until the HP stage is reached.

High-pressure (HP) power stroke. The HP piston rod seals the high-pressure chamber. The increased diameter of the HP chamber renders the LP piston powerless. This allows the oil to flow freely within the HP chamber as the LP piston advances. The force on the ram is increased due to the pressure being multiplied by the ratio between the areas of the air piston and the HP piston rod and the area of the ram piston.

On the return stroke air is exhausted; LP valve immediately opens... allowing oil to flow directly through the piston. Springs return LP piston assembly and ram to "rest" position.

Single Acting Series shown and described



THE POWERPUNCH



7 1/2 Ton MC15-5-9 with UN3 Cage & H2 Punch

THE POWERPUNCH... THE WORKHORSE OF INDUSTRY

Up to 12 1/2 Tons of punching force from shop air.

Multicyl Powerpunch systems have been punching now for over a dozen years using shop air for a fast convenient alternative to the conventional punch press. The PowerPunch is the most popular punching machine combination in industry, with thousands in use. The price tag is very affordable with the benefit that standard unitized tooling may be interchanged in seconds.

Unitized tooling is the most versatile and cost effective method of producing holes in sheet metal parts. Either the medium or heavy duty styles can be accommodated in the same cage.



12 1/2 Ton XL 25-5-9 with UNX4 Cage H2 1/2 Punch

IMAGINEERING

As well as Punching and Notching Multicyl can: Clinch, Fasten, Rivet, Assemble, Crimp, Perforate, Pierce, Blank, Shave, Lance, Shear, Extrude, Dimple, Emboss, Coin, Stake, Draw, Countersink, Mark ... and much more!

Pneumatic controls are simple to install and cost less than electric safety controls used with other mechanical, air/oil or hydraulic systems.

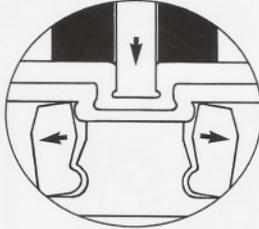
The PowerPunch is the most popular punching machine combination in industry, with thousands in use. The \$2,000.00 (typical) price tag is affordable with uses as varied as punching, notching, clinching and assembly. The many system advantages include:

- Low Capital Investment results in affordable dedicated systems.
- Portable may be used wherever shop air is available.
- Convenient shop air reduces installation and set up time.
- Versatile either tooling or cyl may be interchanged in seconds.

MULTILOC®

MULTILOC

Our latest trade name MultiLoc describes the product range used for joining most kinds of material, especially pre-painted and pre-finished materials, where spot welding or riveting may not be possible. Companies in the HVAC, automotive, lighting, office furniture and the appliance industries are switching to this proven fastening technology which is ideal for the air/oil principle of Multicyl.



The standard ML MultiLoc Clinch Tool may be interchanged with Hole Punching Unit to create a versatile work cell.

THE ML SERIES

We have developed a niche for smaller bench mounted models. The most popular is the ML4 which contains a 2" wide standard BTM tool. The .180" diameter joint size is used for 90% of our applications. Smaller portable guns are offered using .120" diameter tooling.

THE 10 TON GUN

A portable gun has been designed for the assembly of pre-fabricated houses where components up to 16 gauge have to be assembled. Joint strengths are critical, as modern building codes have been updated to include specs such as earthquake-proof. After our prototype was approved, the samples were tested and compared to our competitors' joints. The results were surprising. The .250" diameter tooling really works, our joint was 60% stronger than the competition.



10 Ton Gun may be hoisted into position for heavier applications

This style of gun uses a booster/hydraulic cylinder for power, as the overall body height of the Multicyl would have been too long to access the structural building components.



2 Ton Portable MLP2 MultiLoc Gun

PROD

TUBE PIERCING & NOTCHING

TUBE PIERCING

There are several Multicyl models designed specifically for tube piercing with long strokes and lower tonnage. The short power stroke used for punching in flat sheet metal is increased to allow front feeding for tube piercing. Two hand anti-tie down safety systems are recommended.



Pierce round or shaped tubes with dimpled holes through one or both sides



TOOLING

The standard tube piercing unit is designed to pierce from one or both sides of the tube. Units may be arranged to pierce irregular shaped tubes or for gang punching.

TUBE OR CHANNEL MANDREL PUNCHING UNITS

For use where a dimple free hole is required. Round or shaped holes can be punched through a mandrel in round or shaped tubing. Hole positions are close to the end of the tube for this modular style of tool. A mandrel style die set would be used for piercing clean, dimple free holes deeper into the tube.



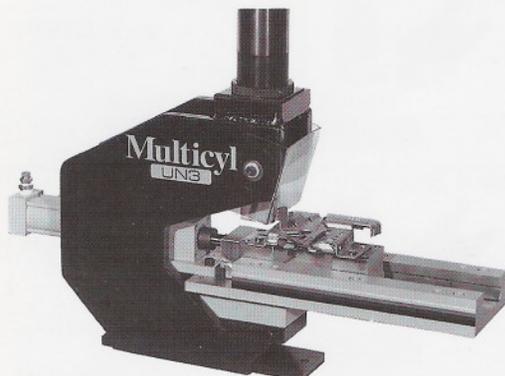
Mandrel Style Tube Punch Units may be supported (shown left) for strength. Both sides of the tube can be pierced simultaneously with Special Units.

ASSEMBLY

ASSEMBLY

Multicyl is used as the power source for virtually any assembly method where two or more parts are fastened together including riveting, staking, crimping and clinching. In this circuit breaker assembly the Multicyl is not actuated until the part has been tested under working conditions, by passing a pre-timed electric current through the switch. Using a standard Multicage housing, the auxiliary pneumatic and electronic operations were easily accommodated due to the open design feature.

Marking, Date Stamping and PEM Nut Assembly are typical automated applications.



Automotive components riveted in Slide Machine

Multicyl, The Automated Solution. For safety reasons the parts are sometimes pre-assembled in a slide which then advances to automatically stake with a shorter or guarded stroke. A slide may be used in automated systems.



Innovative automated systems may be built for assembly operations

CELLULAR MANUFACTURING & QUICK DIE CHANGE



Multicyl systems use the same tooling as a conventional presses

CELLULAR MANUFACTURING

By building Multicyl into the tool the user may enjoy the benefits of "instant tooling", combining the tool and press in a single unit. Eliminate downtime by incorporating Multicyl into the die design. With production tooling permanently set up, a high level of quality may be maintained from a less skilled work force. Fast set ups cut downtime considerable on job changeover. Ease of operation and safety helps workers become more productive by providing a safe, simple set up which may be quickly remounted on other tools.

By storing a "family" of dies at a Multicyl Work Station, unnecessary movement may be eliminated. The tooling on this type of random-order machine may be interchanged in minutes, sometimes seconds. Compare this with one hour of using a fork lift and add the duties of a set-up man and supervisor to re-allocate the production worker.

Eliminate the space provision for parts storage and material handling for 'Work in Process'. Space requirements are dramatically less. Replace large presses with smaller workstations positioned in-line on regular workbenches. The smaller size permits closer location to secondary operations such as shearing, forming and packaging. From raw material to finished goods the tool changeover time is reduced dramatically.

DOUBLE ACTING

For longer applications where longer overall and power stroke may be required, use the DM or DX series. Tooling (usually up to 200 lbs max) may be fastened to the ram. The use of a flexible coupler isolates the cylinder from transverse forces.

The secret to success is to balance the load within the tooling. Unlike a press which has gibs and slides a Multicyl system relies on the accuracy and reliability of the tool to provide a balanced load con-



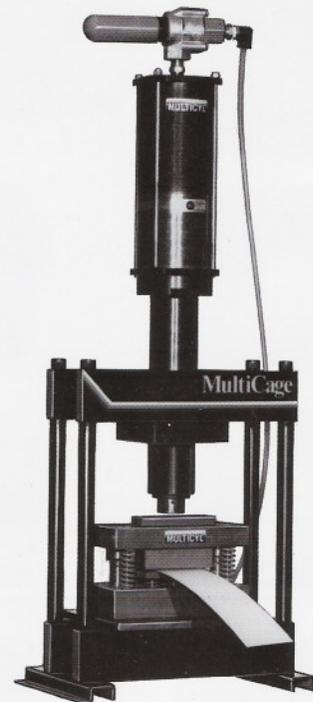
The double acting DX Series produce up to 4" of overall stroke

SHEARING

SHEAR SIMPLICITY

The Shear Simplicity of a Multicyl System. Take a standard Shear Die and combine it with a Multicyl system and the result is an affordable Shear which can be used as a dedicated or versatile workstation for cutting steel or coil stock. Cycle speeds of up to 60 strokes per minute can be achieved. No need to use 10 or 12 foot Shear for small work. By varying the cylinder and other components many different combinations can be achieved.

Packages available in shear lengths up to 12", material thickness 1/8" maximum, up to 25 tons.



TONNAGE REQUIREMENT

$$\text{Shearing tonnage} = S \times \text{Shear Length} \times T$$

$$\text{Round Holes} = S \times \pi \times D \times T$$

$$\text{Stripping Formula} = \text{Shear Length} \times T \times 3500 = \text{Force in Pounds}$$

Example : 1" dia. in 16 gauge Mild Steel
 $25 \times \pi \times 1 \times .060 = 4.7 \text{ Tons}$

S : strength (tensile) of material	Factors for materials:	
D : diameter	Steel	25
T : thickness	Aluminum	15
	Stainless Steel	40

Stripping force, as described above, up to 7% may be needed depending upon material and tooling conditions.

Punch and die clearance can dramatically change the punching load on metal as compressive stress is rapidly replaced by shear stress, whenever die clearance is increased.

Tool conditions, such as alignment and guidance can cause premature wear on cutting edges with resultant increase in working forces. Sharp tools need less force.

Shear Angle on cutting tools may reduce force by up to 50%. However, this may result in the need for a longer power stroke.

Shop air pressure variations proportionately affect Multicyl for force output.

SYSTEM VERSATILITY



SYSTEMS TO FIT YOUR BUDGET

CHART

Chart shows how a typical sheet metal part can be punched and notched using various combinations of workstations. Costs are controlled by matching the system to production quantities. Prototypes can be made in a cost effective manner using a single Multicyl and interchanging the tooling.

CNC punching machines only punch one hole at a time and may be outperformed by (example E) for high volumes.

EXAMPLE

- Material = .036" thick Mild Steel
- Part requires : 4 notches @ 2" x 2" = 3.6 tons each; 8 holes @ 1" diameter = 2.8 tons
- Suggest using 7 1/2 ton Multicyl with standard 3 x 3 notchers and 1" diameter capacity unitized punching tools.

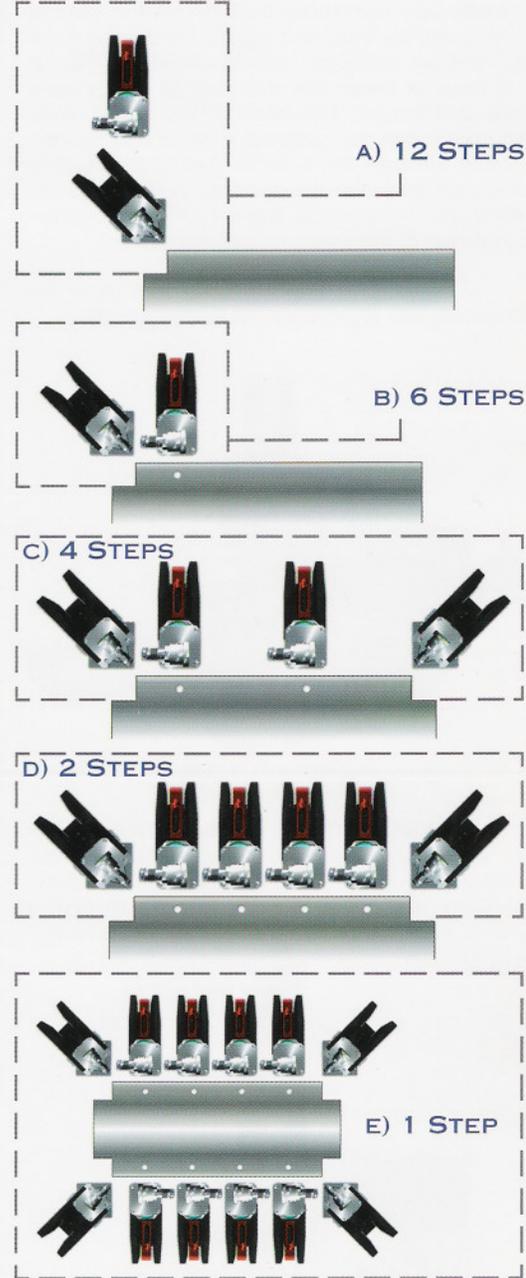
A) Using a single Multicyl station and interchanging tooling, corners may be notched and holes may be punched individually in 12 STEPS.

B) Two Multicyl stations, one for notching, one for hole punching, results in the part produced in 6 STEPS.

C) Using one corner notch, and two hole punching stations reduces the number of operations to 4 STEPS.

D) Add a second corner notch and two punch stations to punch half of the symmetrical part in one hit, complete part in 2 STEPS.

E) One Multicyl for each station produces the ultimate punching machine to complete the part in 1 STEP.



Example	(Number) of Multicyl PowerPunch stations	# operations @ 5 secs per hit *	capital cost (approx)	cycle time (sec)	parts/hour	tool set up time
A	(1) x 7 1/2 ton Multicyl notcher & punch unit	12 operations	\$3000	60	60	extensive
B	(2) x 7 1/2 ton Multicyls 1 notcher 1 punch unit	8 operations	\$5000	40	90	high
C	(3) x 7 1/2 ton Multicyls 1 notcher 2 punch units	4 operations	\$7000	20	180	low
D	(6) x 7 1/2 ton Multicyls 2 notchers 4 punch units	2 operations	\$14000	10	360	low
E	(12) x 7 1/2 ton Multicyls 4 notchers 8 punch units	1 operation	\$28000	5	720	none

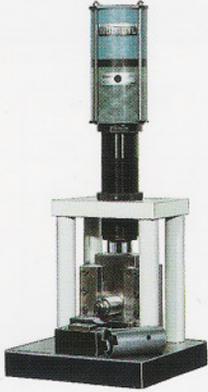
* includes 4 seconds for handling

Send for Tube Piercing & Notching brochure for more information.

SYSTEMS

TUBE PIERCE

Mandrel supports may be supplied for certain tubes to prevent distortion. Tool steels may be varied to suit the application. For example, high speed steel or equivalent may be supplied for punching stainless steel or high volumes.



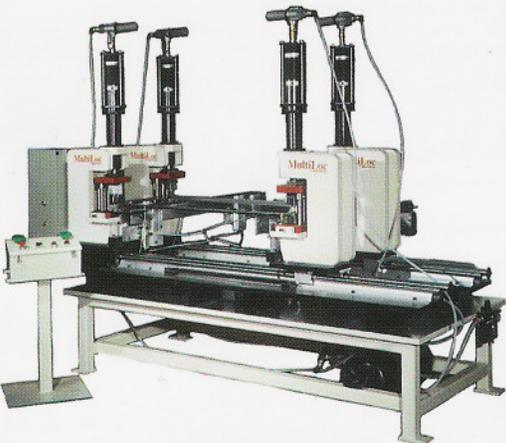
Unique Mandrel tool pierces from the inside for burr free bore

MULTILOC

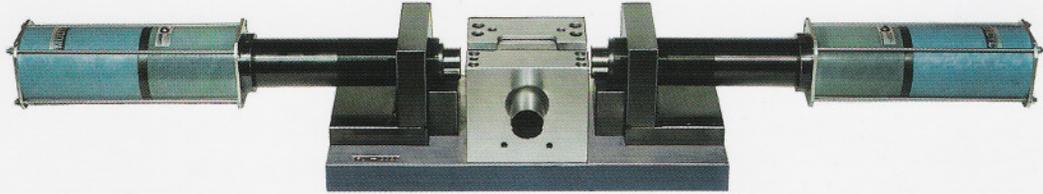
Automation Developments.

Prepainted rollformed metal furniture components were assembled with two adjustable axes; from 12" to 30" in one axis and 12" to 60" in the other. The frame consisted of four pieces of pre-painted 20 gauge steel which had to be clinched with 2 joints per corner. Important were ergonomics, fast cycle time and quick set ups. The rear axis which contained two Multi Loc diesets, advanced forward to the load position. Drop pins assured fast, accurate, pre-engineered locations for the variations in standard part sizes.

Proximity sensors in the dies detected the piecepart and signalled for the machine to cycle. Dies were spring returned with a built-in depth stop to protect tooling and assure constant piece part quality. After the four corners were clinched two conveyers were used to lift the part out of dies and transfer it downstream to the next workstation.



We build custom MultiLoc workstations for jobs large and small



Double tube notching tool, one end one operation

MULTIPUNCH

From concept to the completed turnkey system, we can build special Multicyl powered systems to combine our experience in air/oil power and motion control. A variety of sheet metal parts may be produced without tool changes with a MultiPunch system. This concept uses the principle of a "programmable progressive die" to synchronise the action of several Multicyl stations. Material may be fed manually or with automated motion control.



MultiPunch - 100 tons of programmable punching power

TUBE NOTCHING

For notching tubing there are three alternative methods depending on production volumes.

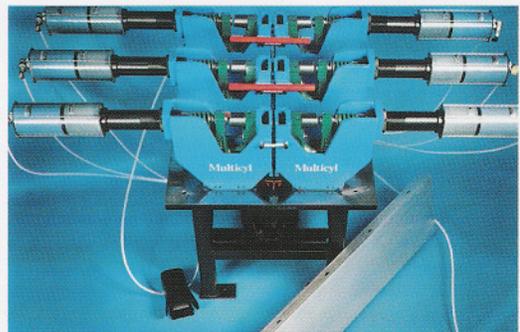
Single notch tool - uses standard Vogel or Project Tool housing to complete the notch one end in two operations, first one side then revolve the tube 180 degrees then second hit.



Double notch (see above picture) - a more expensive option as two Multicyls are used. Completes one end of the tube using an internal mandrel powered horizontally first one way then the other in a cycle time of 2/3 seconds.

Two double notch tools - uses two double notchers one for each end, to complete both ends simultaneously. A secondary end motion is required to allow the tube to clear the tooling before it is fed onto the mandrel.

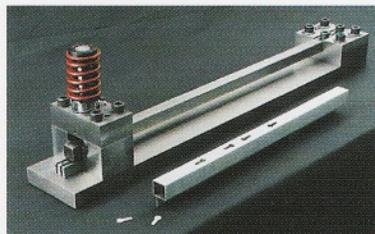
Many profiles of notches, slots and holes can be punched into tubes. Various materials may include steel, aluminum, plastics, etc. Profiles can be round, square, rectangular, etc. More recent developments include the notching of non-symmetrical parts as shown in the above drawing.



Slots for road signs punched in continuous lengths.

POWERPUNCH

Slots for road signs punched in continuous lengths. A typical custom built unit used 6 separate tool stations, with up to 45 tons of force available to punch around holes into extruded aluminum up to 12" wide, used for overhead signs, made in unlimited lengths. The opposing cages were made with a spring mechanism to compensate for the extrusion width which was not always constant. A series of rollers were used to guide the extrusion through the punch stations. Note : For horizontal operation of a Multicyl(r) simply ensure that the filler hole is upright to ensure the transfer of oil from the reservoir to the high pressure chamber. Upside down operation may be performed on certain Multicyl models. This is done by adding an internal reservoir and modifying certain components upon assembly in our shop.



Add a Multicyl to a Mandrel Die for long components

Note : for horizontal operation of a Multicyl, simply assure that the filter hole is upright to ensure the transfer of oil from the reservoir to the high pressure chamber. Upside down operation may be performed on certain Multicyl models. This is done by adding an internal reservoir and modifying certain components upon assembly in our factory.

SELECTOR CHART

A MULTICYL® System is as Easy to Select as 1-2-3

- HOLE PUNCHING • NOTCHING • DIE OPERATIONS • BLANKING • FORMING • MARKING • STAMPING • METAL CLINCHING • ASSEMBLY • AUTOMATION • TUBE PIERCING • TUBE NOTCHING

1. The Multicyl is selected according to stroke and tonnage requirements, dependent on available air pressure. The patented two-stage action advances the tool to the workpiece under minimum force, automatically producing a short working stroke wherever the advance force is exceeded.

1 - CYLINDER

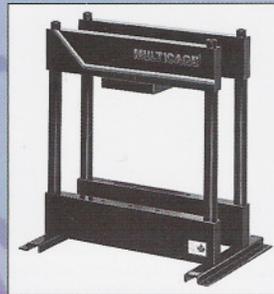
Series	Model No.	Max. Tonnage	Overall Stroke Length	Power Stroke Length	Cycle / minute	Weight (Lbs)	Overall length (")	Max cyl (")	Mount Thread Spec Dia	Force Output (lbs)			Max Air Consumption Cu.Ft./Stroke @			
										80psi	100psi	120psi	80psi	100psi	120psi	
MC	SINGLE ACTING	MC12-5-4	6	5/8"	1/8"	60	17	16 1/4	3 3/4	2 1/2 16 TPI	8320	10400	12480	.068	.085	.102
		MC15-5-9	7-1/2	5/8"	9/32"	45	21	22 3/4			10400	13000	15600	.15	.188	.226
		MC5-16-20	2-1/2	2"	5/8"	30	24	25 1/2			3400	4400	5400			
		MC12-16-7	6	2"	7/32"	30	24	25 1/2			8320	10400	12480			
XL	SINGLE ACTING	XL25-5-9	12-1/2	5/8"	9/32"	30	37	23	4 3/4	75 mm 1.5 Pitch	17200	21500	26000	.247	.31	.375
		XL5-12-48	2-1/2	1-1/2"	1-1/2"	45	40	26			3400	4400	5400			
		XL15-16-16	7-1/2	2"	1/2"	30	40	29			10400	13000	15600			
		XL20-16-7	10	2"	7/32"	30	40	26			14000	17500	20000			
			DX25-28-16	12-1/2	3-1/4"	1/2"	30	47			33	17200	21500			
DX	DOUBLE ACTING	DX12-14-48	6	2-1/4"	1 1/2"	30	47	33	4 3/4	75 mm 1.5 Pitch	8000	10000	12000	1.2	1.5	1.8
		DX12-32-32	6	4"	1"	30	47	33			8000	10000	12000			
DL	DOUBLE ACTING	DL60-28-16	30	3-1/2"	1/2"	25	185	50	5	Flange	39200	49000	58800	2.4	3.0	3.6
		DL70-28-16	40	3-1/2"	1/2"	25	285	53			52000	65000	78000			

*Dm & *DX Series are double acting cyls.

2 - CAGES - MULTICAGE

The Cage or Frame is available in pillar, "C" frame and custom design.

Model No. (Dimensions in inches)	12MCP1215	12MCP1825
Width Between Pillars	12	18
Standard Tool Open Hgt.	9	9
Horizontal Cross Beam Size	1 x 3	1-1/4 x 4
Vertical Pillar Diameter	1	1-1/4
Maximum Force (Tons @ 2,000 lbs.)	15	25
Total Weight (lbs.)	66	135
Bolt Diameter	5/8	3/4
Maximum # of Mounting Plates	2	3
Multiple short stroke cylinders may be used for increased tonnage		



12MCP1215 Shown

USE AIR/OIL POWER FOR YOUR DEDICATED WORKSTATION presses up to 121/2 Tons of force. Two-stage stroke Lengths up to 31/2"

This checklist will assist you in selecting the correct components.

- Cylinder - Single or Double Acting?
 - Tonnage
 - Safety - Feed Height
 - Overall Stroke - Power Stroke
 - Material Thickness
 - Available Air Pressure
- Cages
 - Width - Tool Height
 - Multicage;
 - Number of Mounting Plates
 - C-Frame: Throat Depth
- Air Control
 - Foot - Palm - Automated System

Product Templates Faxed Upon request

STANDARD THREADED MOUNTING PLATES				
MCDM SERIES				
MP2	MP12	MP18	MPX12	MPX18
1" THICK				1 1/2" THICK

Caution: for optimum design strength the punching load is applied against the underside of the Multicage beam or similar cage design, not the SHCS. Special Mounting Plates upon request.

2 - CAGES - C-FRAME DESIGN

(inches)	Unit Tooling		Corner Notch		Universal	
	MC	DX/XL	MC	DX/XL	MC	DX/XL
Model No.	UN3	UNX4	CN33	CNX33	UN5	UNX5
Inside Width	3	4-1/2	5	5	5	5
Tool Open Height	9	9	6	6	9	9
Cage Width	4-1/2	6-1/4	7	8	10	10
Throat Depth	4	4	4-1/2	4-1/2	7	7



UN3 Shown

3 - AIR CONTROL

The Air Control Package is chosen according to material handling and safety considerations.

Air Control Packages should confirm to all safety standards regarding operator pinch points. For a safe stroke, Multicyl will self-adjust if open height is reduced to less than 1/4", otherwise guards or anti-tie down system should be used.

ACP1	ACP4	ACP4-P	SA-1	SA-1-P
ON/OFF 3 Way Valve Foot Palm or Solenoid Control	Two-hand Anti-Tie Down Control	Two-Hand Anti-Tie Down Control/Pilot Valve	Quick Exhaust Shut-Off Valve for additional cylinder	Quick Exhaust Shut-Off Valve/Pilot for additional cylinder

Standard Tooling Packages are available from stock to complete your turn-key system including C-Frame Punch Units, Corner Notch Units, Marking Units, Tube Pierce and Tube Notch Units. Custom tooling to suit special requirements is available upon application.

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