Controlled Automation FLAT BAR DETAIL LINE

PRE-ENGINEERED METAL
BUILDING FABRICATION

Detail Line

Controlled Automation's Detail Production Line is one of our most in demand metal building system machines. This machine is for anyone serious about producing connection plates and base plates up to 1" thick by 12" wide. Controlled Automation continues to serve the metal building industry as the strongest supplier of beam punch lines, anglelines, plate cutting machines as well as our other fabricating machinery, and material handling systems, providing complete plant automation. Any manufacturer equipped with this Detail Line, a Flange Line and web cutting MultiMAX plasma cutting table will be able to compete with any metal building company.

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Applications

- Pre-engineered Building Systems
- General building fabrication
- Fast production of connection plates, base plates, etc.

Features

- Small compact size
- Maximum material positioning speeds of 3 ft. per second
- Advanced material sweep adjustment to track odd shaped stock
- Constant material probing and monitoring for constant accuracy and to maximize material usage
- Shear accuracy is maintained by the use of hydraulic hold-downs along with material support cylinders
- The most advanced pinch wheel measuring system
- 215 ton Double Punch
  (250 ton optional)
  and/or 143 ton Single Punch
  (215 ton optional)
- Large capacity 350 ton shear
- Various gauges on single or double punch cycle with available adapters
- Minimum material: 1/4” x 2 1/2”
- Maximum material: 1” x 12”

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User Interface

The Detail Line control system has an easy to use interface. As the machine runs, the status of each part or operation changes in real-time. A part list dialog can be displayed to show which parts have been completed or which operations are remaining. The controller can be easily networked to the office computer network for the downloading of parts programed in the office or produced by most drafting and design programs.

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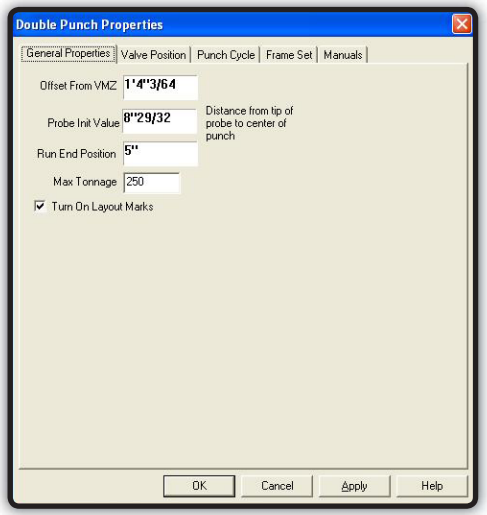
Diagnostics and Monitoring Screens

Using the diagnostics screen, the operator is allowed to cycle through the machine processes *(shearing, punching, etc..)* for each component to ensure the machine is operating correctly. The monitoring screens monitor each of the machine components during it's operation.

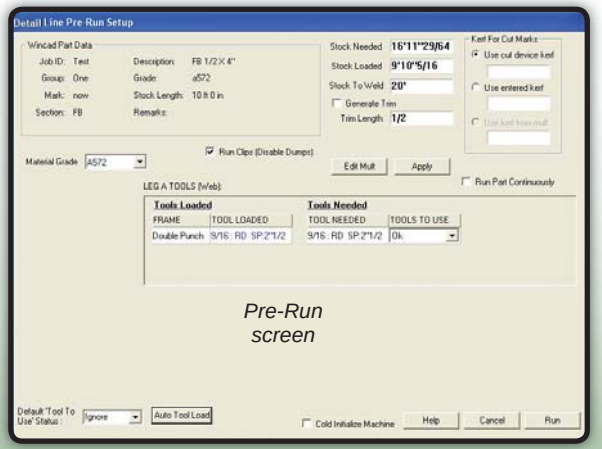
Diagnostics screen



Monitoring screen

Internet Diagnostics

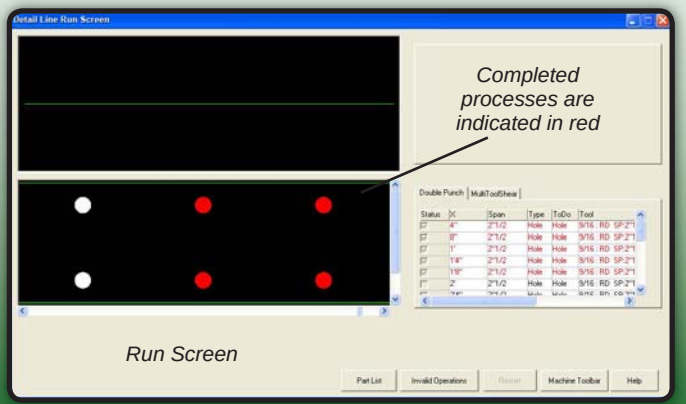
If your machine has an internet connection, Controlled Automation service technicians can perform diagnostic testing and machine calibration via the internet.



Pre-Run screen

The Pre-Run Screen

The pre-run screen is designed to allow the operator to change certain machine settings before running a part. The operator can choose and verify the tools for the machine, set the materials stock length, change kerfs desired, modify part quantities in a mult, change the material trim length, etc….



Run Screen

Run Screen

During the running of a part or a mult the operator gets visual feedback as to the progress of each part. The machine can be stopped at any time and restarted. Operations can be repeated or skipped.

Machine Software

The main control software for all equipment comes complete with diagnostics capabilities and monitoring screens. This helps the maintenance personnel trace down any possible problems which may occur with ease. Every input relay and output relay can be checked via the diagnostics software. Every quadrature encoder input and every digital to analog output can also be verified through the software diagnostics.

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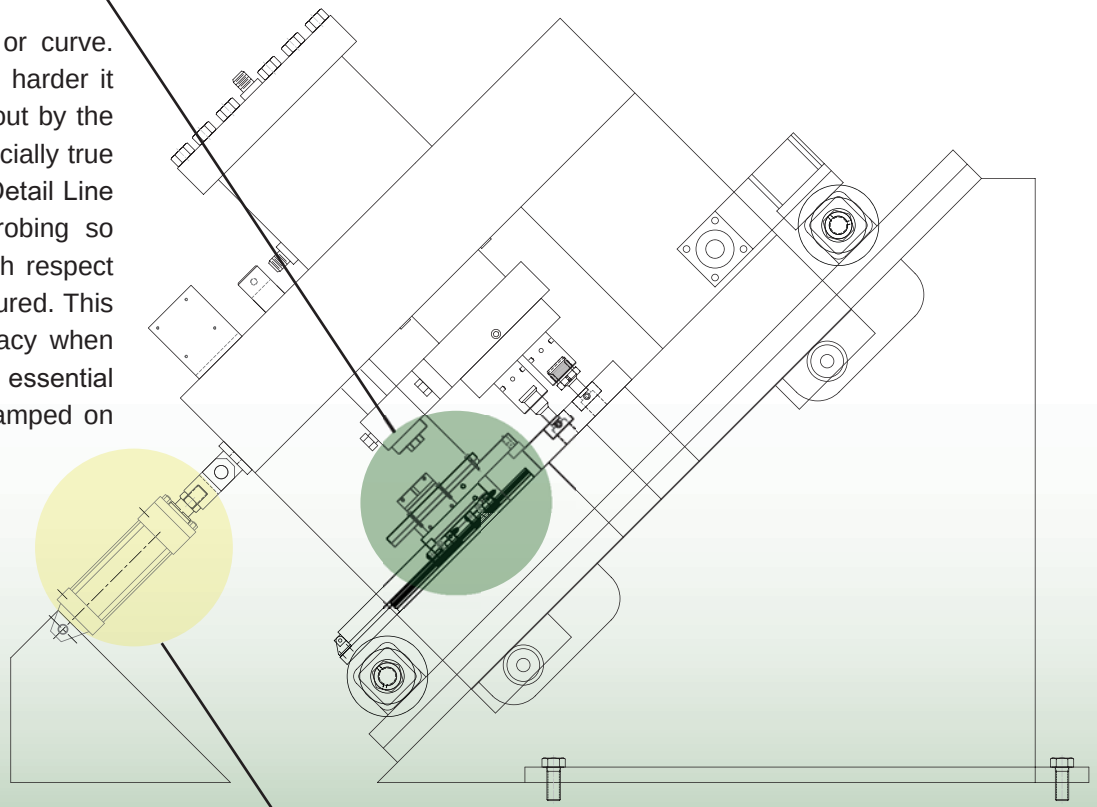
Material Probing

All material has some bow or curve. The heavier the material the harder it is for the curve to be taken out by the material clamps. This is especially true for a sweep in flat bar. The Detail Line uses continuous material probing so the true material position with respect to the punch is always measured. This achieves greater hole accuracy when processing flat bar. Probing is essential when the material is only clamped on one side of the punch.



Hydraulic Positioning

The punch frames are positioned hydraulically using a computer controlled hydraulic valve system. The valve system provides fast, accurate positioning of the punch frames.

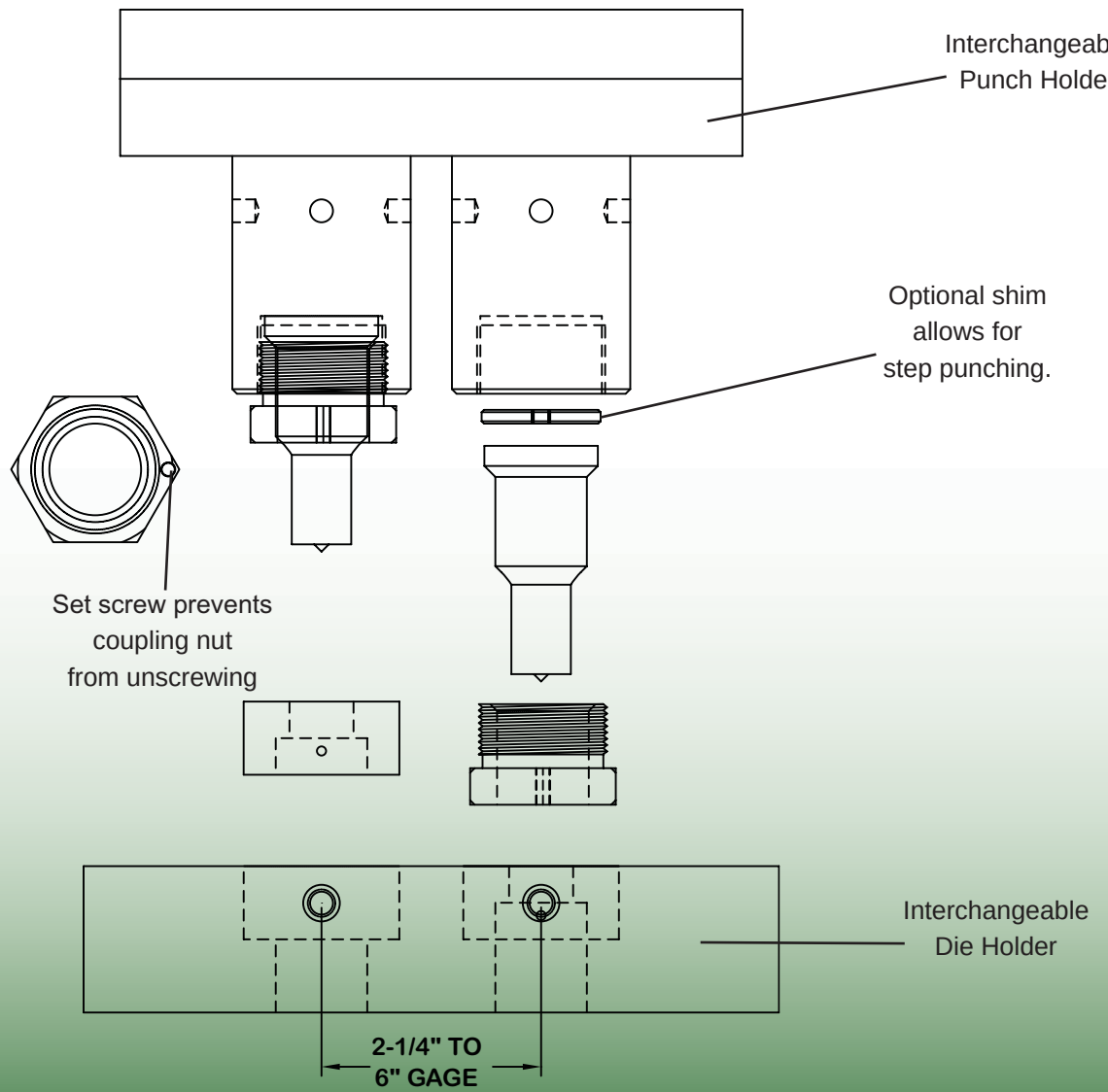
Double Punch

The Double Punch allows you to punch two round holes at a time. Each punch and die set is paired to your specifications with a gage distance between the holes from 2-1/4” to 6”. Changing out the punch and die set takes about one minute, further improving your production. The Double Punch is available as a 215 ton or *optional* 250 ton unit.

Stripper

(shown above in yellow)

Our Double Punch has a unique, automatically operated hydraulic stripper to hold the material, on both sides of the punches, flat against the die while the punch is retracting. This gives better hole quality and extends punch and die life.



Double Punch and Die Block Tonnage

215 Ton Punch Information

(optional 250 ton available)

Punch used on standard punch stem is a Cleveland Punch & Die C-770, and die is C-740.
Maximum hole diameter 1-1/8”
(1-5/16” optional)

Various *optional* punch holders for use with shaped punches are available at an additional cost.

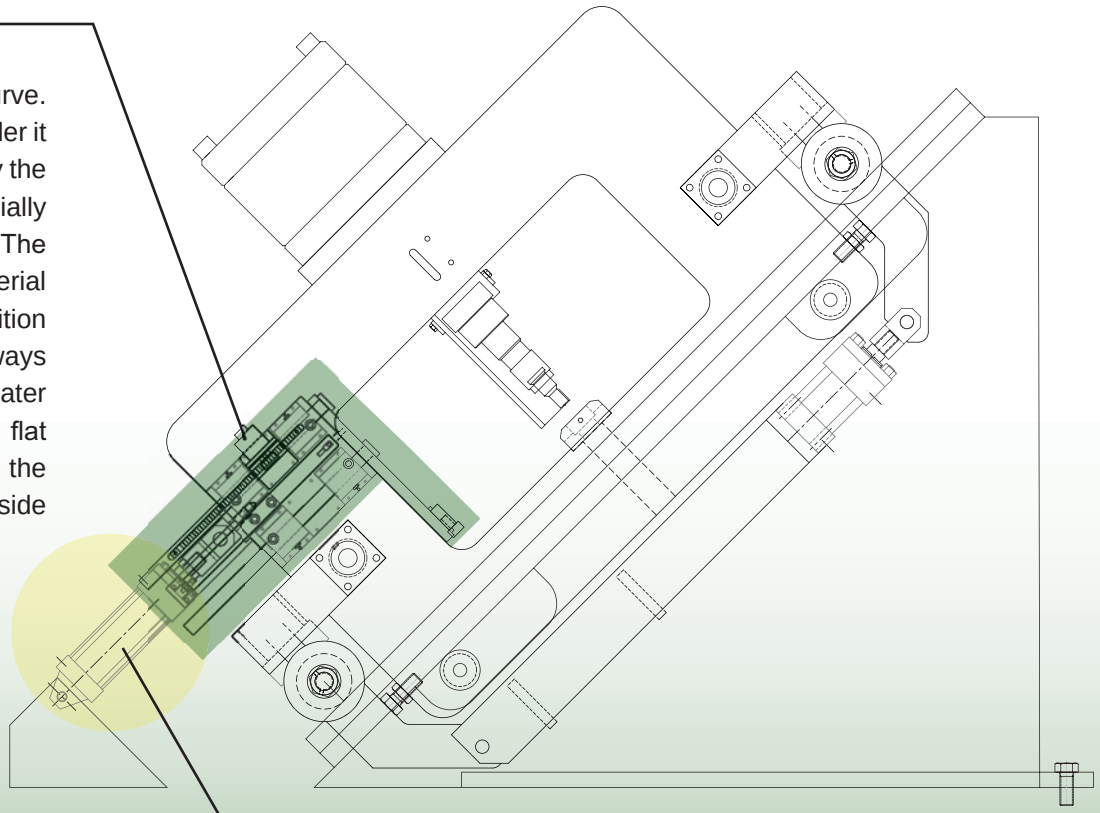
Maximum tonnage for this stem is 125 ton each, and limited to 215 ton total due to cylinder.

Maximum hole size for 1” plate w/ 70 ksi shear strength is ø1-1/8”

Gage distance between punches: 2-1/4” - 6”

Material Probing

All material has some bow or curve. The heavier the material the harder it is for the curve to be taken out by the material clamps. This is especially true for a sweep in flat bar. The Detail Line uses continuous material probing so the true material position with respect to the punch is always measured. This achieves greater hole accuracy when processing flat bar. Probing is essential when the material is only clamped on one side of the punch.



Hydraulic Positioning

The punch frames are positioned hydraulically using a computer controlled hydraulic valve system. The valve system provides fast, accurate positioning of the punch frames.

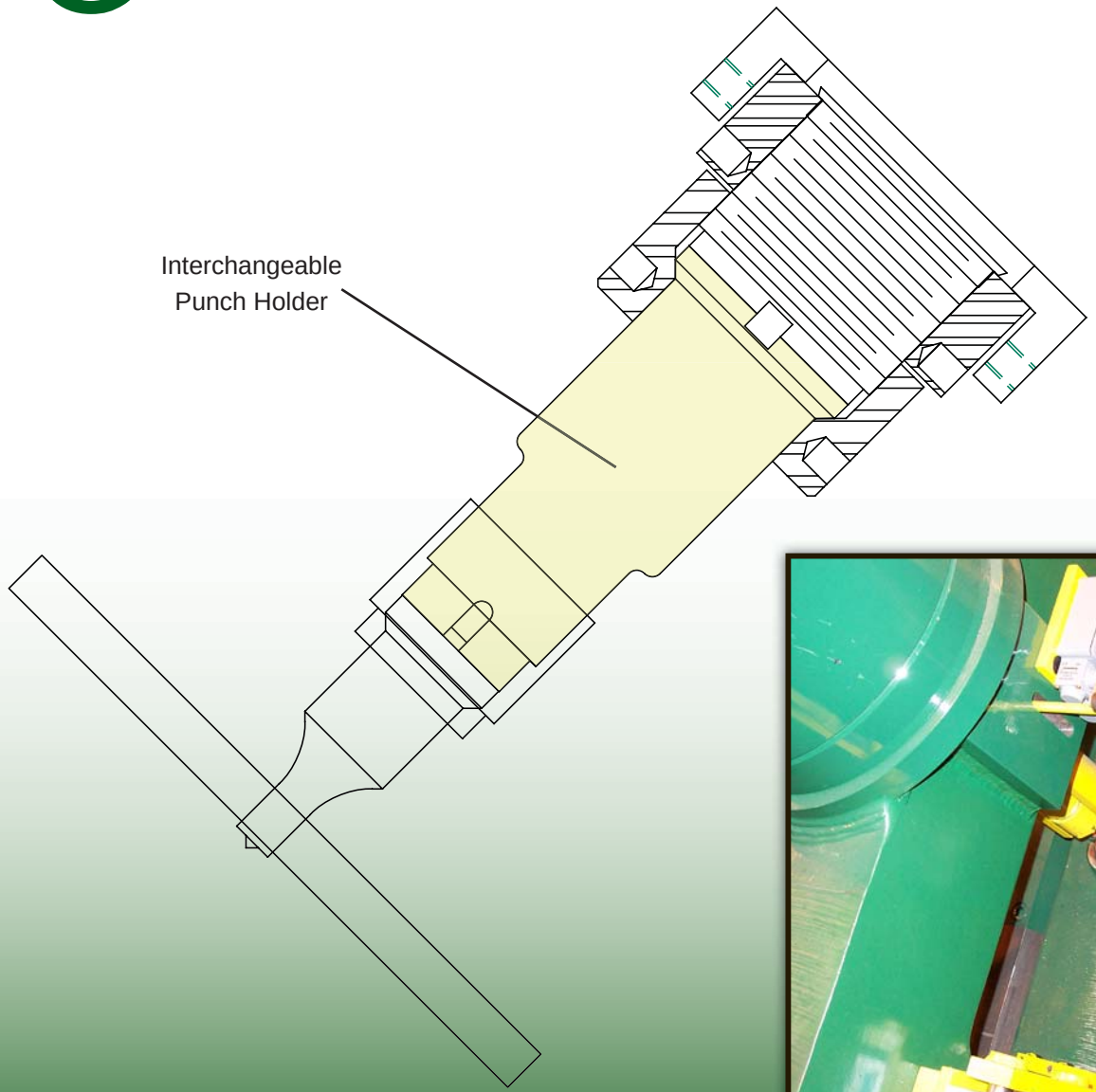
Single Punch

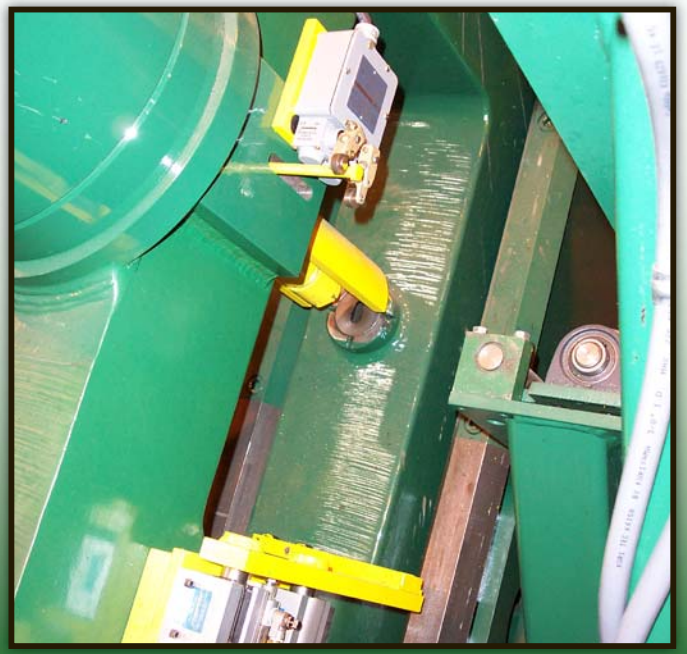
The Single Punch frame will punch round and shaped holes at any location required. The punch stem is interchangeable with *optional* punch holders that use smaller and less expensive punches. The standard machine comes with a 143 ton punch frame. An *optional* 215 ton punch frame is also available.

Stripper

(shown above in yellow)

Our Single Punch also has our unique, automatically operated hydraulic stripper to hold the material flat against the die while the punch is retracting.





Single Punch and Die Block Tonnage

143 Ton Punch Information

(optional 215 ton available)

Punch used on standard punch stem is a Cleveland Punch & Die Fig. 26, and die is C-7502
Maximum hole diameter 1-9/16””

Shaped punches can be used with a Single Punch

Maximum tonnage for this punch stem adapter is 143 ton

(optional punch stem adapters available to meet your tooling needs)

This single punch frame has an edge to center distance range of 1” - 12”.

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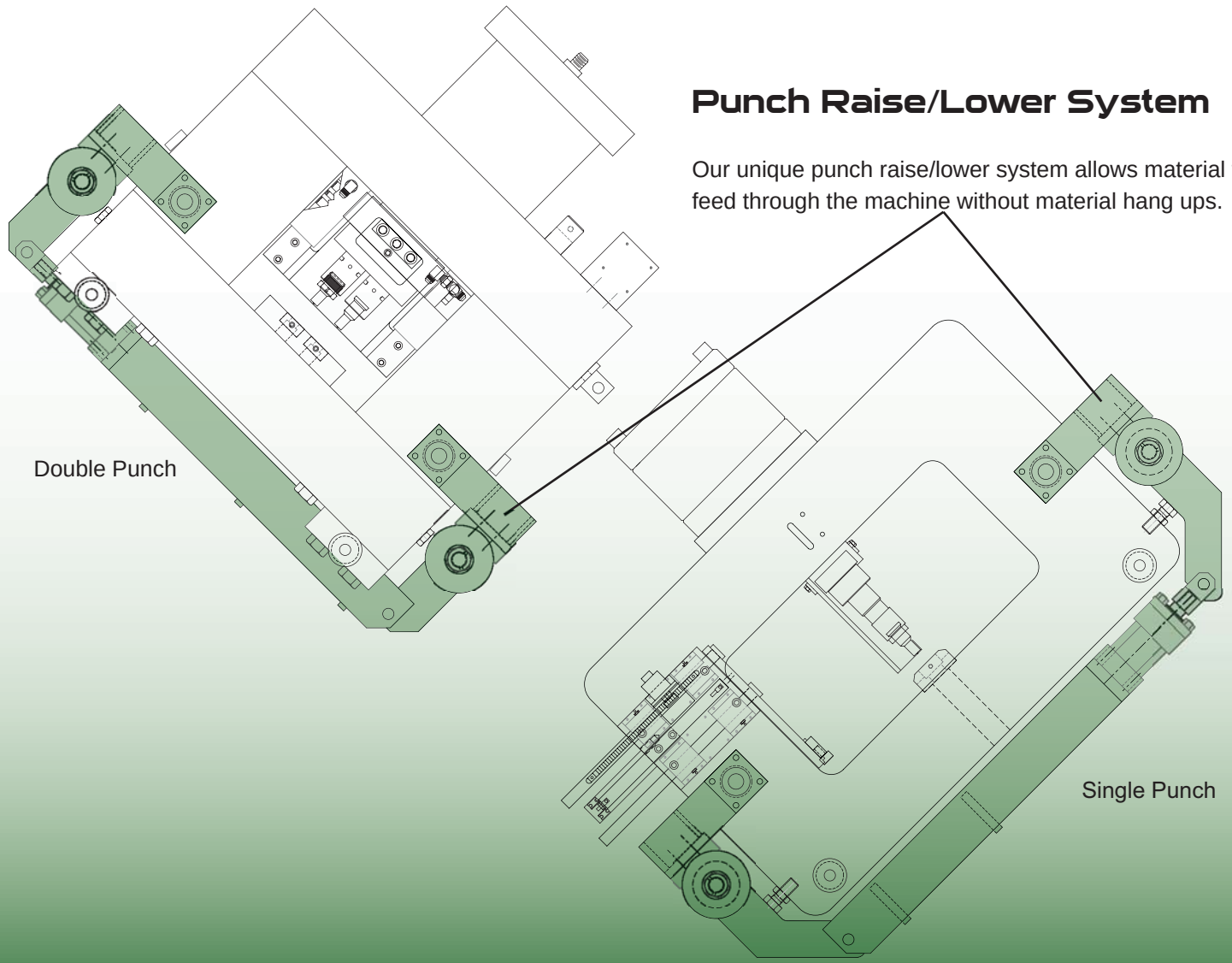
Punch Raise/Lower System

Our unique punch raise/lower system allows material to feed through the machine without material hang ups.

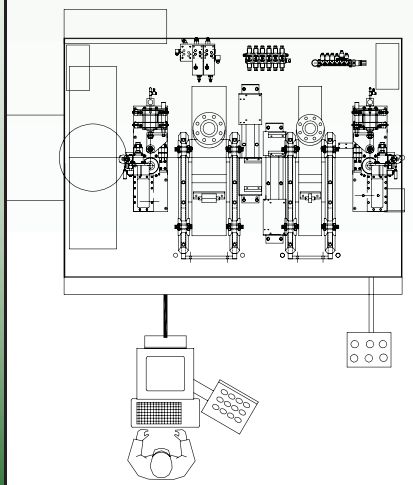


Double Punch

Single Punch

Punch Frames

The Detail Line has two punch frames available, and either one or both can be selected. The standard Double Punch frame punches two holes per cylinder stroke, at a selected gage. This is designed to mass-produce connection plates with two holes. The Single Punch frame will punch holes at almost any gage, and multiple gages per part. This frame is perfect for job-shops that require versatility and high-tonnage punching. If your high-volume shop receives more than 5% non-standard gages or larger holes, you should consider a machine with both punch frames.



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Detail Line Shear

Our single cut shear has zero kerf *(no wasted material)*. It has an integrated in-feed hold-down and out-feed material support cylinders to securely hold the material while shearing. The slight rake angle of the blade, along with the material support cylinder, creates an accurate and clean cut with very square edges every time. It has the standard extend and retract limit switches as well as an encoder to allow the shear to retract only enough to clear the material being cut.

Material Out-feed Support Cylinder

Holddowns

The holddowns are wheels that pneumatically engage the material to keep the material processing through the machine correctly. They help bowed material process through the machine without hitting the punch frames or the shear. The holddowns also keep the material from moving during punching and shearing.

Pinch Wheels

The pinch wheels are designed to pull the material through the machine at high speeds. The pinch wheels grip the material between a knurled wheel and a hold down wheel using an air cylinder. The knurled wheel is turned by an AC servo motor. A separate wheel with an encoder sends length measuring data to the computer.

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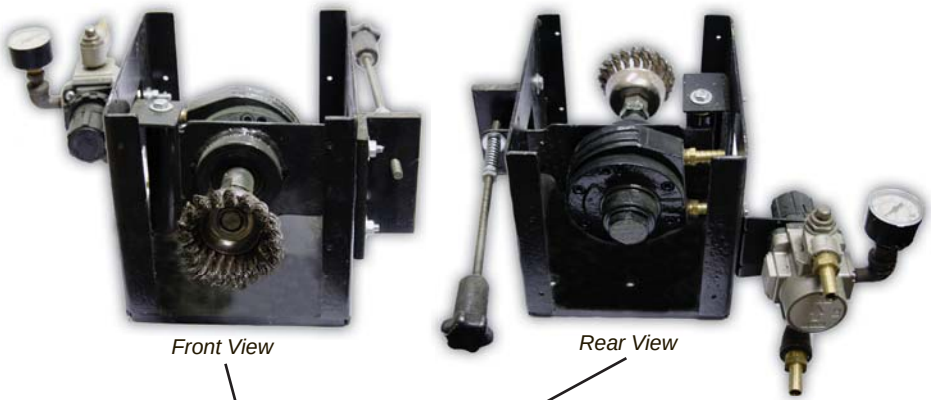
Material Surface Cleaning

The Detail Line has an automated wire brush assembly designed to remove debris from the material surface before the material contacts the measuring wheel and part marking unit. This allows the measuring wheel to provide accurate material position feedback to the controller as well as producing a clean surface for the inkjet marking system.

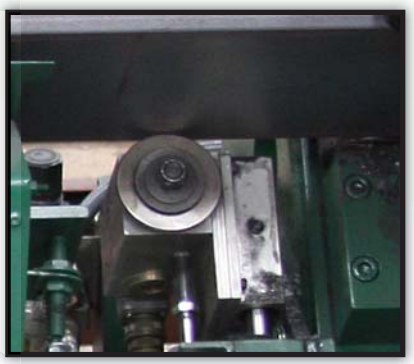


Front View

Rear View

Length Measuring

The Detail Line uses a single servo powered pinch wheel to pull the material through the machine. In conjunction with the powered pinch wheel, a separate measuring wheel will contact the material and rotate as the material is pulled forward. The measuring wheel uses an optical encoder for material position feedback. The measuring wheel is located before the first punch. This is combined with the weld station to reduce loss of material at the end of the process cycle.



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Weld / Tack Station

The weld/tack station allows the operator to splice a new piece of flat bar onto the trailing end of the processed material. This allows for continuous flow of material through the machine. The machine can be set up to leave the weld in the part or automatically shear it out of the finished part. The trailing end of the material will automatically stop at the weld station. The customer is to supply welding machine for this operation.

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High Speed Inkjet Marking System

With our *optional* single head inkjet marking system, high quality text can be printed on the material surface at high speeds.

Our inkjet marking system prints alphanumeric characters based on the part number entered by the programmer or operator.

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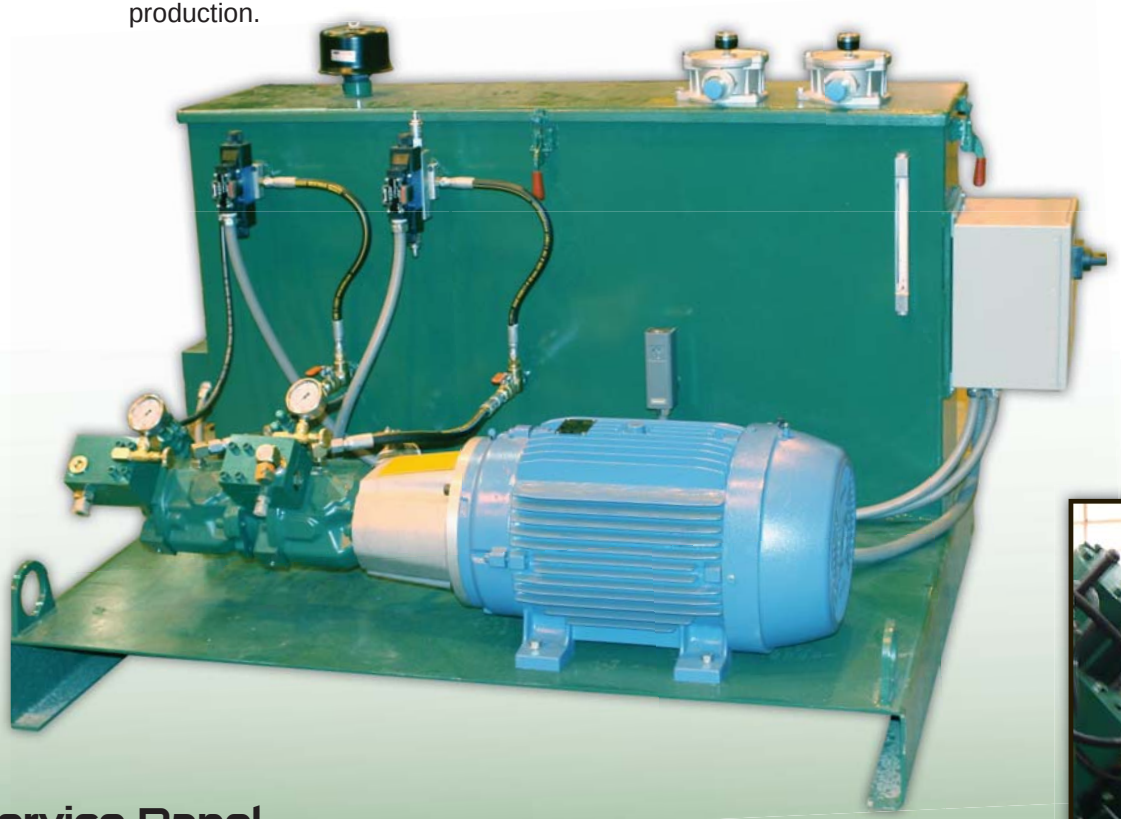
Hydraulic Power Unit

The Detail Line hydraulic power unit provides the pressure required for all necessary machine functions. It is a time proven, dual pump design, that gives long trouble free service life, as well as sufficient power for high speed production.



Service Panel

The Detail Line comes standard with a machine electrical distribution service panel. The purpose of the service panel is to distribute the appropriate voltage to the electrical components of the machine, and to ensure clean, controlled and protected circuits. Controlled Automation supplies the drive isolation transformer, constant voltage regulator, control voltage transformer and fused disconnects for the machine.

(electrical distribution service panel)

In-Feed Conveyor

The standard machine in-feed conveyor consists of 25’ non-powered v-roll conveyor. This conveyor will handle material in lengths from 6’ through 20’. An *optional* longer in-feed is available.

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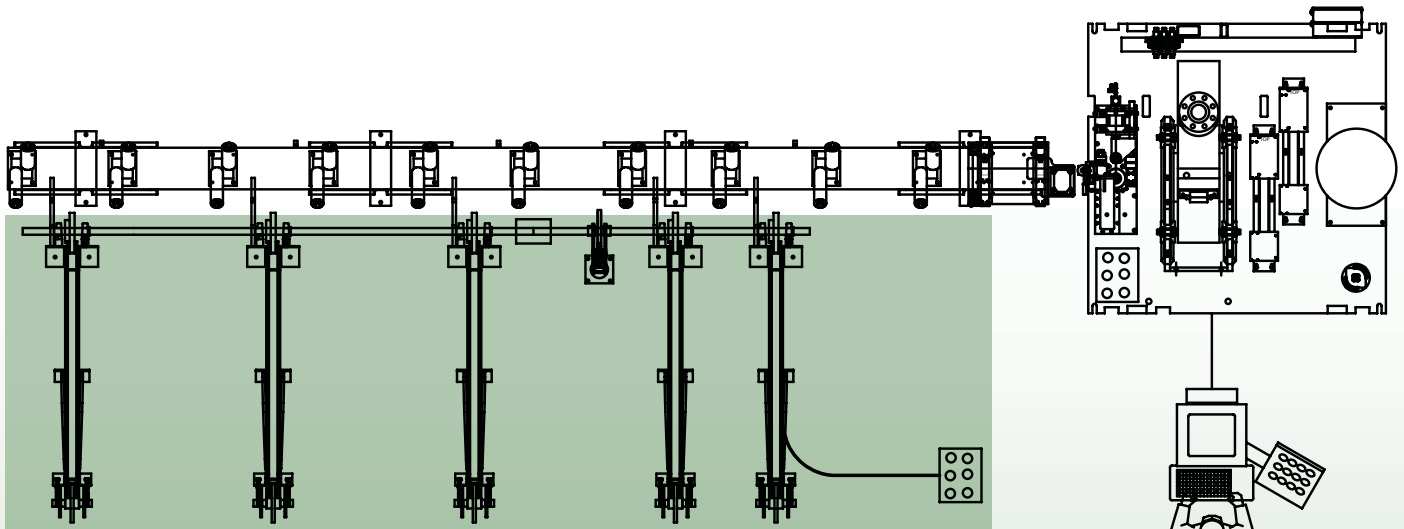

20’ Material Storage and Loading Conveyor

In-feed Load Table

20’ Material Storage and Loading Conveyor

The purpose of the Storage and Loading Conveyor is to stage flat bar adjacent to the Detail Line in-feed conveyor and to load such material onto the in-feed conveyor for processing. The standard conveyor consists of five (5) chain runners using a heavy-duty chain with lug attachments on approximately 13” spacing. Material is placed between each lug spacing and indexed one (1) at a time into the Detail Line in-feed conveyor. The indexing is accomplished with an air cylinder operating a ratchet type mechanism. One (1) cylinder stroke or ratchet position will be equal to one (1) lug spacing. All air valves and electrical controls are included. This unit includes load arms that will lower the material onto the in-feed conveyor and one (1) operator console. We provide the following:

Conveyor Length	12’ Long
Number of Chains	Five (5)
Material Lengths	6’ to 20’
Maximum Bar Size	1” X 12”

optional 40’ material length uses seven lines of chains

For the load table kit *(parts and drawings only) option*, Controlled Automation will supply the following items:

- Five (5) 2-7/16” bearings, bearing mounting blocks, sprockets and set collars.
- Ratchet assembly with 6” bore X 19” stroke air cylinder and air valve.
- Five (5) 1-15/16” machined take-up shafts and five (5) tail shaft sprockets.
- 120’ of 81X chain with master links *(no lugs attached)*
- Five (5) let down arms with five (5) 4” bore X 3” stroke air cylinders, air valves and flow controls.
- Five (5) 1-15/16” split bearings for let down arms.
- One (1) operator control stand.
- 2-7/16” round shafting.
- One set of fabrication drawings.

The customer is to supply all other parts, labor and installation.

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Machine Conveyor Options

Powered Out-Feed Conveyor

This conveyor is located on the out-feed side of the shear. It is powered and has a manual switch to raise or lower one side of the conveyor so it can be used as a work area. The drive motor of this conveyor is controlled manually or by the computer. This conveyor does not have dump capabilities. The length of this conveyor is approximately 5' feet.

5' Powered out-feed

Non-Powered Out-Feed Conveyor

Same conveyor as listed above but without drive motor.

Powered Out-Feed and Dump Conveyor

This conveyor is a V-style conveyor fifteen (15) foot long and is chain driven by a 3/4 hp AC motor. The conveyor has dump capabilities and can be controlled by the computer. There are electric eyes located on the conveyor that are used to signal the control unit when to dump material. The locations of the eyes have an associated constant stored in the computer that will tell what length of material is to dump at which eye. If the cut part is to be dumped, then the auto dump switch is turned to the automatic position. This will cause the powered side of the conveyor to start after shearing and convey the part to one of the electric eyes for dumping. The conveyor will stop for dumping. While the dumping process is taking place, the machine will advance material up to, but not onto, the dump conveyor. The control station also has a manual and bin full switch position. The manual switch lets the operator manually convey and dump the material. The bin full switch on position will cause the material to bypass the primary dump eye and go to the secondary dump position. Up to four (4) of these conveyors can be tied together for a 60 foot material discharge and dump out-feed. The bin and material catch racks are not included with this unit. If this item is purchased, the 5' powered out-feed conveyor must be purchased as well.

5' Non-Powered out-feed

Non-Powered in-feed

Detail Line Production Specifications

Material positioning speed	0 TO 180 ft/min
Accuracy	1/32” electronically

Material Specifications

Maximum bar size	1” x 12”
Minimum bar size	1/4” x 2-1/2”
Maximum initial bar length	20’ *(for standard machine)*
	(40’ or 60’ optional with additional in-feed)
Minimum initial bar length	6’

215 Ton Double Punch Specifications

Maximum hole size	1-1/8” thru 1” @ 70 ksi shear strength

250 Ton Double Punch Specifications

Maximum hole size	1-5/16” thru 1” @ 70 ksi shear strength

143 Ton Single Punch Specifications

Maximum hole size	1-1/2” thru 1” @ 50 ksi shear strength only *(1-3/4” with optional coupling nut)*
	1-5/16” thru 1” @ 70 ksi shear strength
Maximum slot size	1-1/8” x 1-3/8” thru 1” @ 70 ksi shear strength

215 Ton Single Punch Specifications

Maximum hole size	1-11/16” thru 1” @ 80 ksi shear strength
Maximum slot size	Any slot up to 1-11/16” thru 1” @ 80 ksi shear strength

360 Ton Shear Specifications

Capacity	360 ton
Kerf	0”
Maximum bar size	1” x 12” @ 60 ksi shear strength

Hydraulic Power Unit

Electric Motor	30 hp @ 1750 RPM
Low pressure pump	20 GPM @ 2000 PSI
High pressure pump	13 GPM @ 4500 PSI
Reservoir	80 gallons
Thermostat/oil heater	Included

For more complete information on this or any of our machines, contact our sales department at 501-557-5109 or sales@controlledautomation.com

(All specifications are subject to change without notice)

Controlled Automation specializes in the manufacture of automated structural steel drilling, punching, and shape cutting machinery. We also build material handling systems to complement each type of machine we offer. As well as new machinery, we are the industry leader in retrofitting control systems and remanufacturing existing structural steel fabricating machinery. All machines and controls are designed and manufactured entirely in the United States of America. All software is developed and supported in the United States of America.

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