Controlled Automation ABL-100

ANGLE AND FLAT BAR LINE
The ABL-100 is the most versatile, and fastest angle and flat bar punching and shearing machine on the market today. The high speed servo motor, continuous probing, continuous clamping, advanced servo and valve positioning software make it not only fast but very accurate. The ABL-100 is offered by Controlled Automation with such options as, 115 ton or 143 ton single or double punches, single or double cut shear options ranging from 215 tons up to 425 tons, dual shear machine models, a variety of length measurement options as well as part marking and stenciling unit options.

Machine with material flow from left to right, single punches and single 425 ton single cut shear shown.
Machine Base

The punch frames and clamps are mounted onto the surface of a steel platform which is reinforced with steel braces inside. The punch frames are flame cut from solid steel plates, which are machined to suit the design of each particular machine in our own machine shop. Most machine plumbing, hydraulic, gas, and air, along with all electrical wiring is routed through the machine base to eliminate tripping hazards and clutter on and around the machine. This machine base is engineered with the rigidity to support the shearing and punching operations, and to maintain consistent part accuracy over years of strenuous angle and flat bar production.
Stripper

Each punch frame has our unique, automatically operated hydraulic stripper (shown left in yellow) to hold the material flat against the die while the punch is retracting. This provides cleaner holes, as well as greater tool life.

A partial retract switch is mounted to the stripper. This allows the punch to retract only enough to clear the material. This greatly improves production speeds.

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, without the maintenance problems involved with competitors ball screw positioning systems.

Punch Frames

The ABL-100 is offered with two punching tonnages, 115 ton or 143 ton. On a single punch machine model, the customer can choose between either tonnage option. However, the double punch machine option is only available with 143 ton punches. The punch frames are a closed “O” style frame, not an open “C” frame as with most machines. This means that the frames deflect less during punching of higher tonnage holes, which in turn provides a longer tool life.

As with all Controlled Automation machinery, the majority of the parts are manufactured in house, including the electrical panels, the guide ways, and clamps.
Punch Adapters

Our machine is unique to the industry in that the punch holders are interchangable. This allows the operator to easily change out the punch holder to use the tooling that best meets the requirements of a particular job. We have may standard styles of adapters in stock, and can custom build any style to meet your specific needs.

115 Single Punch Tooling
Standard single punch tooling for the ABL-100
CP&D fig. no. C-770 Punch with CP&D fig. no. C-740 Die

Minimum Angle Length Minimum Gauge
1-1/2" ≤ 2" 11/16" + angle leg thickness
> 2" < 5" 1-1/16" + angle leg thickness
> 5 ≤ 7" 1-3/16" + angle thickness
> 7" 1-13/16" + angle thickness

Maximum tonnage for this stem is 115 tons

115 Dual Punch Tooling
Optional double punch tooling for the ABL-100
Standard double punch tooling for the ABL-100-2 using lighter punches & dies for closer gage and cost-effective tooling
CP&D fig. no. C-770 Punch with CP&D fig. no. C-740 Die

Minimum Angle Length Minimum Gauge
1-1/2" ≤ 2" 11/16" + angle leg thickness
> 2" ≤ 6" 1-1/16" + angle leg thickness
> 6" 1-3/16" + Angle thickness

Maximum tonnage for this stem is 115 tons

143 Single Punch Tooling
Optional single punch tooling for the ABL-100
CP&D fig. no. 26 punch with CP&D fig. no. C-7502 Die

Minimum Angle Length Minimum Gauge
1-1/2" ≤ 7" 1-3/16" + Angle leg thickness
> 7" 1-13/16" + Angle leg thickness

Maximum tonnage for this stem is 143 tons

143 Dual Punch Tooling
Optional single punch tooling for the ABL-100
Standard double punch tooling for the ABL-100-2
CP&D fig. no. 26 punch with CP&D fig. no. C-7502 Die

Minimum Angle Length Minimum Gauge
1-1/2" ≤ 8" 1-3/16" + Angle leg thickness
> 8" 1-13/16" + Angle leg thickness

Maximum tonnage for this stem is 143 tons

Punch diagrams shown in fully extended position
Single Cut Shear Options

These units are designed to cut the material without material loss (kerf). Regardless of which model shear you choose, our shear frames are the most rigidly built in the industry. This provides for a more square cut and longer tool life. Most shear blades have multiple cutting edges which can be sharpened. By sharpening the same blade for continued use, the blade life is longer and more economical.

**CAL Shear**
- Capacity: 215 Tons
- Kerf: 0"
- Maximum Angle: 6 x 6 x 1/2"
- Maximum Flatbar: 1/2 x 6"

**BAS Shear**
- Capacity: 425 Tons
- Kerf: 0"
- Maximum Angle: 8 x 8 x 3/4"
- Maximum Flatbar: 1 x 12"
Double Cut Shear Options

These units are designed to cut the material, while removing some material as scrap (kerf). This allows the material to be cut with less residual stress in the material. One of these shears can also be paired with a CAL single cut shear to accommodate both types of cutting, depending on material size and type of job.

DCS Shear
Capacity: 215 Tons
Kerf: 3/4”
Maximum Angle: 8 x 8 x 3/4”
Maximum Flatbar: 3/4 x 8”

BDS Shear
Capacity: 215 Tons
Kerf: 3/4”
Maximum Angle: 8 x 8 x 3/4”
Maximum Flatbar: 3/4 x 12”

HDC Shear
Capacity: 300 Tons
Kerf: 1”
Maximum Angle: 8 x 8 x 1”
Maximum Flatbar: 1 x 12”
Operator Controls

The operator control station has manual switches that may be used by the operator to turn on the AC power, turn on the hydraulics, halt the machine, move the units, convey the material, and other machine functions. They are designed to be rugged and simple to operate.
Pushing Measuring Probe Carriage

The pushing probe is mounted on the In-feed side of the machine and the probe pushes the material through the machine providing length measurement data to the computer during production. This is the most accurate type of positioning system available by any machine manufacturer, due to the rack and pinion measurement system used.

Single Wheel Measuring

This material length measuring option uses a single servo powered pinch wheel to pull the material through the machine on a non-powered “V-roll” conveyor. A separate measuring wheel contacts the material and rotates as the material is pulled through by the powered pinch wheel. The measuring wheel is located before the first punch frame. This option is normally combined with the weld station option to eliminate material drop. The drop without using a weld station is approximately the distance from the powered pinch wheel to the shear blade.

Dual Wheel Measuring

This material length measuring option uses two servo powered pinch wheels, one before the first punch and the other before the shear, to pull the material through the machine on a non-powered “V-roll” conveyor. There are two measuring wheels, one at the first pinch wheel and the other at the second pinch wheel, that measure the material as the pinch wheels move the material through the machine. This option can eliminate material drop by placing a cut mark on the trailing end of the material to allow the operator to manually shear the remaining material. It may be combined with the weld station option for continuous material processing.
Part Stenciling Units

Thirty Six Position Wheel Stenciling Unit

The *optional* part stenciling unit is specifically designed to imprint alpha and numeric characters on one leg of angle and flat bar. The marking unit is built from a ‘O’ style steel frame hydraulic press with a character indexing wheel turned by a servo motor. The marking press is mounted on its own base with all necessary valves, cylinders, and hoses included. With this unit one character is imprinted at a time. The stenciler unit marking valve pressure can be manually adjusted to produce permanent marks up to 1/32” deep which are legible even after hot-dip galvanizing.

Multi-Position Wheel Stenciling Unit

This *option* allows ten different character strings of six characters per string to be preloaded into the character wheel. The entire string of six characters is imprinted at one time. This works well for customers that have many repeating parts with the same name. When this *option* is purchased, both the 36 character wheel and the multi-position wheel stencils are included.

Cut Off Torch (optional)

The optional oxy-fuel cut-off torch is used to make square end cuts on flat bar, that is larger than what is possible with some of the smaller shears. The *optional* oxy-fuel cut-off torch cannot be used with either the BAS or HDC shears.
Storage And Loading Conveyor

The purpose of the Storage and Loading Conveyor is to stage angle and flat bar adjacent to the ABL-100 in-feed conveyor and to load this material onto the in-feed conveyor for processing. The loading conveyor is indexed by the operator as each piece is loaded. When the table is full the operator need only roll another piece onto the loading conveyor as a piece is processed through the machine. This system frees up the crane or lift trucks while the material is being processed. This also allows the loading conveyor to be staged with different material as the machine is running. Pneumatic let-down arms are located on the infeed conveyor, which gently lower the material into the infeed V-rolls. This reduces wear and tear on the machine. The addition of this optional feature greatly improves the production of the machine. A bundle of material can be placed on a customer supplied bundle rack (drawings supplied by Controlled Automation) and material rolled onto the loading conveyor. (Controlled Automation does not supply the bundle rack)

Hydraulic Power Unit

The hydraulic power unit is designed to supply flow only when needed. This keeps the hydraulic oil from heating, which reduces the chance of hydraulic system failure. The hydraulic power unit has all filters located for ease of maintenance. The unit is easily accessible, being on its’ own palletized base. A thermostatically controlled oil heater is provided to ensure proper function even in very cold shops.
5’ Powered Out-Feed Conveyor and Work Surface

This is an optional 5’ long conveyor located on the out-feed side of the shear. It is powered. One side of its rolls can be lowered and used as a work surface by the operator. This conveyor, due to its close proximity to the operator, cannot be used as a dump conveyor.

5’ Non-Powered Out-Feed Conveyor and Work Surface

This optional 5’ long conveyor is the same as above, however the V-rolls are not powered. This option is only used when there are no powered conveyors used. When this option is chosen, the motor and drive chain can be added at a later time, for use with dump conveyors.

Powered Out-Feed and Dump Conveyor

This optional 15’ or 20’ conveyor is a “V-style” chain driven conveyor used to automatically or manually convey and dump the parts at drop locations. The conveyor automatically dumps parts into a drop location based on the part’s length. The computer senses the location of the part as it is moves down the conveyor by signals from photo eyes which are mounted down the length of the conveyor. When the part gets to the appropriate drop location the entire conveyor roller bed will pivot, dropping the material at the drop location. If a drop location becomes full a switch can be set so the next appropriate drop location can be used. The machine will continue to advance and punch the material as the dump conveyor is operating up to the point the advancing material interferes with the dump conveyor or the material needs to be sheared. Up to four dump conveyors can be tied together for an 80’ material discharge and dump out-feed. The dump conveyor is always used with the 5’ powered out-feed conveyor and work surface. In most circumstances the customer will build simple skid type racks to catch the material. This allows a chain to be wrapped around the material or access to the material by a fork truck.

10’ Non-Powered V-Roll Conveyors

This is an optional 10’ long conveyor is also located on the out-feed side of the shear. The V-rolls are also not powered with this option. This is another option which is only used when there are no powered conveyors used. The standard size on this out-feed option is 10’, however, custom lengths are available upon request.
ABL-100 Production Specifications

**Material positioning speed**
- 0 TO 250 ft/min

**Accuracy**
- +/- 1/32" mechanically

**Punch capacity**
- 115 tons (143 ton optional)

**Maximum hole size**
- 1-3/8" with 115 ton tooling option
- 1-3/4" with 143 ton tooling option

**Material Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>Maximum length of material</td>
<td>40’ (for standard machine) 60’ optional</td>
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<tr>
<td>Minimum length of material</td>
<td>6’</td>
</tr>
<tr>
<td>Maximum angle size</td>
<td>8” x 8” x 1”</td>
</tr>
<tr>
<td>Maximum bar size</td>
<td>1” x 12”</td>
</tr>
<tr>
<td>Minimum angle size</td>
<td>1” x 12”</td>
</tr>
<tr>
<td>Minimum bar size</td>
<td>3/16” x 2-1/4”</td>
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**Channels** (web punching only)

<table>
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<th>Specification</th>
<th>Details</th>
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<tr>
<td>Maximum channel</td>
<td>12”</td>
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<tr>
<td>Minimum channel</td>
<td>4”</td>
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*Channel must be pre-cut or cut by other means using the layout marks from the layout marking process.*

**Stenciling Unit Options**

**Thirty Six Character Wheel Stencil**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>36 Characters</td>
<td></td>
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<tr>
<td>Character height</td>
<td>3/8”</td>
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<tr>
<td>Characters</td>
<td>A thru Z</td>
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<tr>
<td>Numbers</td>
<td>0 thru 9</td>
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<tr>
<td>Character depth</td>
<td>Adjustable up to 1/32”</td>
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<tr>
<td>Max material thickness</td>
<td>1”</td>
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**Ten Position Wheel Stencil**

<table>
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<tbody>
<tr>
<td>Character Depth</td>
<td>Adjustable up to 1/32”</td>
</tr>
<tr>
<td>Up to 6 character/position</td>
<td></td>
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<tr>
<td>Character height</td>
<td>3/8”</td>
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Hydraulic Power Unit

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<tr>
<td>Electric Motor</td>
<td>30 hp @ 1750 RPM</td>
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<tr>
<td>Low pressure pump</td>
<td>20 GPM @ 2000 PSI</td>
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<tr>
<td>High pressure pump</td>
<td>13 GPM @ 4500 PSI</td>
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<tr>
<td>Reservoir</td>
<td>90 gallons</td>
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<tr>
<td>Thermostat/oil heater</td>
<td>110 volts</td>
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</table>

*High flow HPU machine packages are available as an option.*

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. Material handling systems are also available 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 in and supported from the United States of America.