



Victory 11 CNC Single Spindle Drilling Line

MAIN TECHNICAL SPECIFICATIONS

All beams having a maximum section volume of 44" x 44"

Section Length	Maximum	40 ft.
<i>Note: The bed length can be extended indefinitely by adding optional 10 ft. bed extensions.</i>		
Drill heads		1
Spindles per vertical drill head		1
Drilling diameter	Maximum	1-11/16"
Spindle stroke		12"
Power per head (AC)		7.5 HP
Programmable spindle speed	Maximum	1,000 RPM
Maximum beam size		44"
Drill coolant		Internal/external
Positioning accuracy		± 1/64"
CNC control		PC operating under Windows
Total vise clamping pressure (2)		10 tons
Incoming voltage requirement		460 volts, 3 phase, 60 Hz

BENEFITS

- The concept of keeping the material stationary and moving the drilling spindle **reduces the required shop space to less than half** of what is required for a typical multiple spindle drilling head.
- The cost of the FICEP Victory 11 is about **25% of the price of a typical multiple spindle drilling line.**
- **Eliminates manual layout and drilling.**
- The simple two axis CNC control **reduces the required CNC hardware to one third of what is required on a multiple spindle drilling line.**
- The simplicity of the Victory 11 makes it an **ideal fit for firms that are just starting to become involved in CNC technology.**
- **Typical lease purchase cost is less than the cost for a layout man with benefits.**
- **You can be running production within a week of delivery!**
- **Automatically generate layout marks for such elements as stiffener plates.**
- The system is so easy to operate that **no prior computer or CNC experience is required.**
- The ability to process typical structural length sections, and even short detail parts, makes the Victory 11 **equally suited to process beams and even plate and angle detail.**
- **Improve your bid capture ratio.**
- Be able to **respond quickly to receiving delayed drawing releases.**
- The **accuracy of the hole locations are exactly as drawn.**
- Achieve the **productivity that 6-8 men can produce with manual methods.**
- The Victory 11 takes up about the **same shop space as a normal fitting table.**

FEATURES

Control

- The wireless remote feature of the Victory 11 eliminates the need for the operator to constantly walk back and forth from his work location to the CNC control. **This feature enhances the productivity over units with a fixed CNC control location by up to 30%!**
- **If a problem were to develop with the drill bit, the operator can easily place the unit in a feed hold mode with his wireless remote before damaging the drill bit.** If he had to walk over to the CNC control first, the tool would typically be destroyed by the time he can get to the control location.
- **The CNC control features a touch screen to simplify the operator interface with the control.** The system is also supplied with an external USB port so a keyboard and mouse can simply be plugged in if desired.
- **The Victory 11 CNC control is a standard PC** with the powerful FICEP proprietary Arianna software. **This standard hardware can be serviced locally** and even replaced with a standard PC if a problem were to develop. Long term maintenance cost with this hardware configuration is almost nonexistent when compared to the field service rate for commercially available CNC controls.



Software

- The PC based CNC control system on the Victory 11 **automatically generates detailed production control data that can be exported to your estimating program or can be viewed in text or graphical form.**
- **Production tracking** monitors the process time for specific parts by operator or by shift and also tracks the number of parts that have been produced versus the required quantity
- The software **automatically tracks the drill bit use and advises the operator when it is time to change to a re-sharpened drill bit.**



- The Victory 11 software **monitors and records not only the production times but also those non-productive times such as tool changes, maintenance time, etc.**
- The CNC control also contains the powerful FICEP Teleservice software. **With just a phone connection, we can log on to your system to perform the same type of analysis if our service tech was standing in front of your machine.** This permits us to remotely activate elements to confirm functionality, place an oscilloscope on the servo drives to monitor performance, etc. This approach lets us resolve a problem or determine what part is required before we send a service tech to your location.
- **Direct downloading of DSTV or DXF file formats** with our optional CAD downloading software.
- **Automatic input of layout marks for copes in the flanges and drilling of the web hole** to the proper location based upon the drill size that is utilized.

Machine

- The self contained system with all the electrics, pneumatics and hydraulics are located on the movable tower which **eliminates the need drag electrical cables, hydraulic lines and air hoses during each positioning move**. The self contained Victory 11 uses an electrification rail line like an overhead crane to pick up the required power for the movable tower.



- An optional quick-change drill holder makes the tool change as quick as sliding back a spring loaded collar. **No wrenches are required.**
- An integrated tool holder rack keeps the required tools within an arms length.



- The material probe contact location is totally programmable. This, in conjunction with our software for out of square sections, **eliminates the need for the operator, when processing out of square sections, to try to determine where the section's zero point is located.**
- **The 1-11/16" maximum hole size** is ideal for those large hole size applications such as base plates.
- Our proprietary material clamping system clamps the material from both the top and the bottom to **eliminate the need for any manually adjustable external table clamps.**
- The 10 ton clamping force eliminates the need for serrated surfaces in the table. **The smooth table surface of the Victory 11 facilitates the ability of the operator to position sections against the datum line.**
- **The vertical clamp position adjusts automatically to the height of the section that is about to be processed.** This reduces the clamping cycle to the minimum without operator involvement.
- **Probing can occur from either the left or right hand end** so either end can be the zero point.
- **The material zero point laser** is used to establish the zero reference or start position.

- The optional web probe system automatically orients the flange hole pattern relative to the web centerline. **During the probing process, air is used to automatically remove the drill chips from the probing area.**
- Machine guidance system features 8” diameter rolls with **bearings that are guaranteed for life.**



OPERATIONAL PROCESS

The FICEP Victory 11 CNC drilling line has been engineered to eliminate the labor intensive layout operations for the production of holes in both flanges and the web, as well as the subsequent fitting operations such as locating copes, stiffeners and even cut off locations.

In addition to the elimination of manual layout, the total drilling process is automated and performed while the operator is free to be engaged in other tasks such as material handling operations.

The Victory 11 is equally suited to process long structural sections and even short detail members that cannot be typically processed on a conventional drilling line because of their short length.

The versatility of the Victory 11 is further evidenced by the efficient manner that it addresses the following applications:

- | | |
|---------------------------------|-------------------------------------------|
| ▶ Beams up to 44” in depth | ▶ Tapered fabrication sections |
| ▶ Angles both equal and unequal | ▶ Fabricated sections with uneven flanges |
| ▶ Channels | ▶ Tubes |
| ▶ T-sections | ▶ Rails |
| ▶ Flat bars | ▶ Truck frames |
| ▶ Plates up to 44” in width | ▶ Rail car frames |
| ▶ Girders | ▶ Weldments |

Virtually any size of shape that can be fixtured and fits within the processing window of 44” in height a 40 ft. in length (the length can be increased as an option) can be processed.

Process Cycle

Based upon the production requirements, the operator selects the appropriate sequence of programs that are required.

After the programs are selected, the operator positions the parts to be processed against the datum line. The operator then depresses cycle start on his wireless remote control to start the CNC programs as needed.

The laser probe is used for determining the leading end location or reference point. Once the leading end of the part is located, the Victory 11 proceeds to drill, layout or optionally scribe the required pattern.

During the drilling cycle, the drill advances towards the material in a rapid mode and automatically senses the surface location. At this time, the hydraulic feed pressure increases to the selected feed rate and proceeds to drill the hole or make a layout mark as programmed. Once the drill finishes the hole, the reduction in pressure is sensed and it rapidly withdraws from the material. This type of system is used on the Victory 11 so it is not totally critical if the member is up against the datum or not for drilling.

The system of the Victory 11 has two powerful hydraulic clamps (5 tons each) that engage the material from both the top and bottom in a vise type clamping action which ***eliminates distortion to the table over time***. These ***two clamps*** travel with the Victory 11 so there is no operator involvement required to secure the part during drilling.

The position of the vertical clamp is automatically adjusted to the proper height by means of the CNC program. The programmed height position is automatically added into the CNC program based upon what AISC or fabricated section is selected in the programming process. This keeps the process time to the minimum as the clamp does not have to return to the top of stroke and it eliminates any manual adjustment.

If there are flange holes that require drilling, the optional web probing system automatically locates the web surface and then distributes the flange hole pattern around the centerline addressing any off center web conditions that result from mill tolerance problems. A system of compressed air is incorporated into the probing process to make sure any chips that could be located on the surface of the web are removed prior to probing.

As the first part is processed, the operator is then free to position against the datum additional sections to be processed along the length of the bed. After the first section is processed, the system will automatically locate the next section and then executes the CNC program for that part, etc. This process of moving to the next section to be processed continues automatically without operator involvement.

As the Victory 11 proceeds to drill or layout the programmed patterns, the operator is free to perform other material handling functions such as removing a section that is finished, loading the next section to be processed on the bed or rotating a previously drilled section so another surface can be processed.

This operational sequence permits the material handling tasks that are required by the operator to be accomplished without interrupting the CNC drilling and layout operations. ***This means there is no loss of time for loading, unloading or even rotating a section if holes are required in more than one surface.***

The operator has the wireless remote control system located on his belt so he can not only start the programs, but he is able to stop the process to attend to a tooling problem, for example, without having to walk around to the CNC control system to stop the drilling process. This system makes it practical for the operator to truly utilize the drill cycle time to perform material handling functions. ***The wireless remote system truly enhances the productivity of this system by over 30%*** when compared to the old technology where the operator must walk each time to the CNC control.

SYSTEM ELEMENTS

IC *Material Support Table*

IC-1 *Fixed Bed (for 40 ft. Sections)*

The useable area of the fixed bed is 40 ft. in length and is subdivided into a material storage area and an active processing area.



The material storage area is used to shake out material and stage sections in the order that they are to be processed. As required, the sections are then positioned to the active processing area of the table where the drilling takes place.

The fixed bed does not require any additional clamping devices since all the necessary part clamping that is required is provided with the **dual hydraulic material clamping system** that travels with the drill tower.



An electrification rail (like what is found on an overhead crane) is provided on the fixed bed. **This system provides all the power to the movable tower without the need to have any trailing umbilical cords cables and wires.**



The fixed bed is suitable to accept additional devices such as welder's magnets that can be used to secure plates vertically for drilling (not included).

The bed is provided with machine ways complete with positive measuring through a rack and pinion system, which supports and allows for the automatic positioning of the drill head column with the drilling unit.



The piece part or section remains stationary as the drilling head travels the total length of the material bed to accommodate up to 40 ft. long sections as standard. The traveling drilling system is cantilevered off the fixed bed so nothing is touching the floor as this facilitates chip recovery. As an option, this bed length can be increased in 10 ft. increments.



Based upon the desired zero point for a hole pattern, they can be referenced from the top material clamp surface, the machined surface of the fixed bed of the centerline of the web.

WU WORKING UNITS

WU-1 Mobile Column for Drilling Head Positioning

The mobile column is self contained and houses all the required CNC electronics, hydraulics and pneumatics. This design eliminates the need to have to supply shop air or to have any cables physically connected to the tower. The requirement to have trailing umbilical cords and hoses is totally eliminated since the tower is self-sufficient and picks up its power from the electrification rail that is mounted to the fixed bed.



(The exclusive three-point guiding system uses 8" diameter rollers to guide the tower into the programmed position. FICEP Corporation offers a lifetime guarantee on the bearings of this movable tower assembly as we have used this design since 1978 with uncompromising results.)

WU-2 *Monospindle Horizontal Drill Head*

The CNC controlled drilling spindle is positioned vertically (Y Axis) on the movable tower assembly by means of a ball screw assembly that is powered by a servo drive.



Technical Specifications:

- ▶ Maximum drilling capacity in grade 50 material 1-11/16"
- ▶ Vertical (Y axis) positioning range 3/8" – 43"

The drill head described above is supplied with:

- One AC infinitely variable drive motor to ensure spindle rotation.
- Hydraulic spindle feed system with a variable feed valve.

The spindle is provided with:

- Devices to sense and initiate the following cycles:
 - Rapid advance of the spindle to the material surface with high volume but low pressure to the spindle.
 - Feed of the drill bit through the material is accomplished by changing the oil flow to a lower volume but at a higher pressure.
 - Return of the drill spindle upon completion of the drilling operation with a high volume of oil but at low pressure.

Note: This type of system is used since the section that is being processed may not always be in contact with the datum.



- External spray mist coolant system is provide when solid drills are utilized in the system.

- A screw type air compressor which generates the required air flow on demand, in conjunction with coolant through the spindle, enables the utilization of oil hole drills which are desirable for faster drilling rates when processing heavier sections



WU-3 Vertical Hydraulic Clamping System

This system consists of two separate clamping cylinders which generate a clamping force of up to 10 tons. This automatic clamping system is integrated into the movable tower which also contains the hydraulic power unit to effect this action.



The position of the top clamp adjusts automatically based upon the section height that is to be processed to reduce the clamp and unclamp cycle to the minimum and then to automatically set to the proper height for the next section to be processed without having to always go back to the top clamping position.



A second hydraulic clamp advances from the bottom to secure the material in a vise-type action. This proprietary design feature eliminates any clamping forces to enter into the fixed bed. The total force that is transferred from the section to the bed is never more than the weight of the section.

The hole pattern that is generated can be referenced from the table or from the top clamp. The top clamp reference feature is frequently utilized when drilling web holes in a cambered beam where it is desired to have the web hole pattern follow the camber in the section.

WU-4 Device for Referencing the Zero Point Location of the Material

A laser is used to sense the leading end of the section or plate to establish the zero reference point. From this zero location, the programmed hole pattern is established.

HY HYDRAULIC AND PNEUMATIC SYSTEM

HY-1 Hydraulic Power Pack

The system includes:

- Hydraulic power pack is totally enclosed to generate the high and low working pressure for the drill spindle and for the auxiliary machine functions.
- Hoses and necessary connections.
- Hydraulic system is located on the movable tower so it is not necessary to run hydraulic lines from a fixed location to the movable tower. The power unit is engineered to fit in the movable tower and is complete with the required solenoid valves and manifolds.



▶ Working Pressure 750 PSI

EL ELECTRIC SYSTEM

EL-1 Interconnecting Machine Wiring

EL-2 Electrical Cabinet

This cabinet is integrated into the movable tower and it contains all the power and control equipment for the unit's positioning axes and for the auxiliary functions.

All the internal electrical components such as the servo drives are domestically available either from the manufacturer or from stock from FICEP Corporation.

The power supply is **460 V – 60 HZ – 3 Phases**.

CN PC Based CNC Control

The Victory 11 utilizes an industrialized PC which uses standard PC components that are locally available from stores selling computer hardware. The Arianna software is a proprietary system that is developed by Mitrol which is a FICEP owned firm. Mitrol manufactures all the CNC controls for FICEP; however, 80% of their control sales are to firms outside of FICEP. This impressive firm has developed the Arianna system with specific features for the North American structural steel fabrication industry that includes extensive help screens and diagnostics that are uniquely tailored to this industry and its applications.



Operators find the touch screen in conjunction with the Windows based operating system easy to utilize

The CNC is equipped with:

- digital inputs (24V)
- digital outputs (24V)

The control panel is an industrial PC containing the CNC and having the following specifications:

- 850 Mhz Celeron CPU with 128 MB RAM, 10 GB HD, FDD
- Color video TFT 12.1"
- Keyboard panel and auxiliary pushbutton panel
- 10/100 RJ45 Ethernet port
- USB modem
- 4 serial ports RS232
- 1 parallel port
- 1 additional USB port to enable the connection with an external floppy drive (not included in this quotation)
- WINDOWS XP operating system

Programming Features

- Conversational programming
- Graphic part representation
- Downloading by wireless network (option)

Machine Cycle

Once the work piece is loaded onto the work table and positioned against the datum line, the operator selects the program and depresses cycle start from his wireless remote. The process then commences as follows:

- The zero probing system automatically locates the leading end of the section and then references the programmed hole pattern from this zero position.
- After the zero reference is established, the drill head moves in both the x and y axis to the programmed location.



- Once the spindle achieves the programmed length dimension, the vertical vise clamp is initiated to secure the part to the work table.
- The drill automatically rapidly advances towards the material and senses the material contact and commences drilling at the selected feed rate.
- As the drilling process is concluded, the drill break-through is automatically sensed, and the spindle rapidly returns back to the home position.
- The material vice unclamps slightly when all holes or layout marks are completed for automatic positioning to the next programmed location in the length axis.

Since the parts can be located anywhere along the datum line, once the first part is processed, the drill will automatically move to the next part and establish the zero reference on the next part and commence drilling.

Output

The output varies as this is dependent upon the number of holes, their location and the material thickness. The typical averages in structural steel generally run between 100 and 160 holes per hour.

PA STANDARD PAINTING

The system is painted in the following standard colors:

- Light Grey RAL 7038
- Black Grey RAL 7021
- Yellow RAL 1028

TD TECHNICAL DOCUMENTATION

The system is supplied with the following technical documentation:

- Programming, maintenance, and instruction manual
- Electric schematics
- Pneumatic schematics

SP SAFETY PROTECTIONS

SP-1 Protections on the Machine (Included)

SP-2 Outside Protections

The movable tower of the Victory 11 is furnished with devices to automatically sense if the tower were to come into contact with anything in its path. If this occurs, the system will immediately stop all motion.

SUPPLIED WITH FOLLOWING OPTIONAL FEATURES

OWU-2 Through-The-Tool Coolant System

This option provides the capability to apply an air mist lubrication directly at the tool's cutting surface when used in conjunction with oil hole drills.



This option includes the necessary coolant system, valves, electrics, plumbing and a screw-type air compressor that is integrated in the moveable drill tower assembly. This air compressor generates up to 10 CFM on demand so it is not necessary to have a storage tank as part of the system. This eliminates the need to run the air compressor to accumulate air in a storage tank prior to running the Victory 11 or to furnish shop air to the Victory 11.

OWU-1 Web Probing

The probe system will automatically reference the location and subsequent drilling of the flange hole pattern relative to the actual intersection between the web and the flange. This permits the holes in the flanges to be located at a given dimension above or below the web centerline.

