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Sheetmetal Bending with Servo-Electric Power

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Servo-Electric Press Brake

Heightens Accuracy, Lifts Productivity

European styling, quality and craftsmanship—all qualities of the store-checkout equipment and fixtures fabricated by Laicor Fixtures, whose sheetmetal-fabrication shop reached a new level of quality and productivity by investing in a new servo-electric press brake.

A new servo-electric press brake operating at Laicor Fixtures boasts a patented drive, based on the pulley principle, which evenly distributes forces in the top beam. The result: optimum accuracy, increased productivity and decreased energy consumption, with minimal maintenance requirements, claim Laicor officals.

In 1974, Finnish-born Andy Laitila visited and fell in love with Canada. In 1996, he founded Laicor Manfuacturing in Peterborough, Ontario. Today, Andy Laitila runs the business with his three sons, Mika, Toni and Rami.

In its early days, Laicor established a reputation for high-quality contract-fabrication work (mostly stainless steel) and fast turnaround times. In 1999, the company entered the checkout market, supplying equipment and fixtures to supermarkets and retail outlets, and changed its name to Laicor Fixtures.

Laitila was no stranger to the checkout industry. Prior to founding his Canadian company, he spent 14 years as president of a large

Laicor takes pride in its products' unique and modern European styling, quality and craftsmanship with their contoured side walls and rounded corners. Management says that new sheetmetal-fabricating equipment has helped it efficiently develop its stylish products.

checkout-counter-manufacturing company, which during his leadership grew from a startup operation to become one of North America's largest checkout manufacturers. Concepts that Laitila implemented that were pivotal to the company's success included effective use of emerging computer technology, product customization and just-in-time manufacturing.

Productivity Doubles

In its early days, Laicor's fabrication equipment consisted of a single-station mechanical punch press, a hydraulic press brake and a few cutting saws. As the company grew, it added equipment to keep up with expanding production. But the most dramatic purchase, says Laitila, took place in March, 2005: a combination turret punch press and right-angle shear (a Shear Genius flexible manufacturing cell from Finn-Power Intl., Inc., Schaumburg, IL).

The impact of the Shear Genius quickly became apparent at Laicor, which fabricates galvanized steels, stainless steels and aluminum alloys in sheet thicknesses from 20 to 11 gauge.

"We went from old machines and old production styles to a more modern and faster method," explains Laitila. "The Shear Genius more than doubled our productivity. There were immediate savings since we used to require two operators in the fabrication area to run the older machines, which we replaced with the Shear Genius and only one operator."

According to Mika Laitila, manager, engineering and design, other benefits of the Shear Genius include versatility and accuracy. "We run very small lot sizes," he explains. "With the Shear Genius and the (Finn-Power) NC

The servo-electric press brake's quick-change tooling eliminated the pain from Laicor press-brake operator Robert Dickson's wrist and elbow, which he injured changing tools on the firm's older hydraulic press brake. Also, due to quick setup times, Laicor finds the press brake productive on particularly short runs.

Express software, we can run dynamic nests. You will not see the same nest numbers going through the Shear Genius twice—it's always different quantities, different lengths and orders intermingled. Because the clamps hold the sheet for both punching and shearing, the parts have optimum accuracy. As a result of this improved accuracy, we nearly doubled productivity on our older hydraulic press brake."

Servo-Electric Brake Brings Further Gains

An equally dramatic impact to the company's bottom line came in the fall of 2005, when Laicor went shopping for a new press brake to replace its aging hydraulic machine. "We felt that to realize the full benefit of the combination shear-punch machine, we needed to replace our aging press brake," explains Mika Laitila. After careful evaluation, Laicor purchased a servo-electric 80-ton press brake (an E Series model from Finn-Power).

The press brake employs a patented mechatronic drive that results in even distribution of forces in the top beam, optimum accuracy, increased productivity and decreased energy consumption, and few maintenance requirements, according to Finn-Power officials. The frame concept makes it possible to use the brake's backgauge system across the entire working length of the machine.

The servo-drive system allows for a rapid advance of the ram to the material, a programmable working (forming) speed, programmable stroke parameters and rapid return speed of the ram. This flexibility enables maximum cycling rates without compromising control.

The machine's rapid positioning speeds ensure that the backgauge will be ready when the part is presented for each operation. Ram deflection and the need for compensating bed crown is virtually eliminated, and the machine's pulley design—a system with fixed and moving rolls spread over the total working length of the upper beam with a belt—equalizes force transmission.

By combining the new press brake and the shear-punch combination, Laicor has broken new ground in productivity. "The press-brake operator can trust the drawings and doesn't have to measure everything coming off of the shear-punch, because he knows that the parts will be accurate," says Andy Laitila. "There also are downstream benefits, in our assembly areas for example. About half of our shop is assembly. We have holes on every part, so if a bend if off by even 1/16 in., we can have major assembly challenges. However, the accuracy of the E brake is phenomenal, typically within 0.003 to 0.004 in."

Relieving the Pain (literally) of Tool Change

Another feature of the E brake—a quick-change tooling system from Wila USA, Columbia, MD—provided a critical benefit to Laicor, on a very personal level. Laicor's long-time press-brake operator and programmer Robert Dickson (its first employee) had developed a severe case of carpal-tunnel syndrome in his wrist and elbow from the arduous efforts of changing tooling on the firm's old hydraulic press brake.

"Tool changes on that machine were causing me problems," explains Dickson. "The tooling had to be cranked on and off with a wrench. We're a short-run shop and it's not unusual for us to make as many as 150 setups per day. That's a lot of cranking. The Wila quick-change tooling used on the E brake is much easier to install. It just snaps in place, and to pull it out I simply push a button. Since installing the new brake and tooling system, my wrist and elbow pain have subsided."

Other features of the tooling system include, for the mechanical upper-tooling clamping setup:

- Rapid fastening with patented safety click system;
- Interchangeable precision tools;
- Tools that can be installed in any position along the beam regardless of tool width, no shimming required;
- A fastening mechanism that centralizes and straightens the tools automatically; and
- The ability for horizontal reverse, because the adaptation is symmetrical to the center line.

In addition, the press brake supports all of the available tooling styles to provide rapid tool setups. The universally machined ram accepts a variety of optional clamping systems for different styles of tooling.

Small-Run Specialist

The servo-electric brake has performed especially well for Laicor where production runs are particularly small.

"The E brake is unbeatable on small runs," says Dickson. "I can completely form a part on the brake in the time it used to take me just to set up the older hydraulic machine."

Other benefits of switching from hydraulic to electric power for its press brake include reduced energy consumption. The electric press brake consumes energy only when the beam actually moves. This can result in energy savings to 50 percent compared to conventional hydraulic press brakes. There also is no need to adjust the settings of pressure relief valves, nor must Dickson check and replace filters.

Laicor takes pride in the unique and modern styling, quality and craftsmanship of the products it fabricates, with their contoured side walls and rounded corners. "We customize our products to individual customer needs," concludes Andy Laitila. "This approach to the market demands quick response time and the ability to change quickly. Our new sheetmetal-fabricating equipment has helped up meet this challenge." **MF**

Article submitted by Finn-Power International, Inc., Schaumburg, IL; 847/885-3200; www.finnpower.com.