

Servo Power

Solves In-Die Assembly Dilemma

A pair of gap-frame presses and a straightside press, all equipped with servo technology, deliver a slew of benefits to this automotive-parts stamper. Included is the ability to program slide motion and adjust stroke length, allowing the firm to quote jobs it would not have considered in the past.

BY TOM SKIBINSKI



Metalstamp installed, in 2005, an Aida model NC1-1500 (150-ton capacity) gap-frame press equipped with ServoPro technology. A year later, to meet its growing requirement for in-die-assembly work, it purchased a second ServoPro-driven NC1-1500 press.

When Channahon, IL-based Metalstamp, Inc., proposed a unique in-die-assembly process to help a customer reduce costs, the contract stamper also had to develop and design the tool to run the job. The proposed process would eliminate post-production work.

“Initial tool setup required the operator to stop and start the press multiple times,” says Metalstamp toolmaker and maintenance supervisor Terry Brown,

Tom Skibinski is vice president of operations, Metalstamp, Inc.: Tel. 815/467-7800, www.metalstampinc.com.

who also is responsible for equipment purchase and implementation. “We had been very successful running a couple of these dies, but the question facing our engineers was, ‘How do we run at higher volumes and gain the necessary production efficiencies?’ We knew that a conventional straightside press was not the answer.”

Having attended the 2004 METALFORM trade show and learning of servo-based mechanical-press technology, Brown decided to look into ServoPro forming technology from Aida-America, Dayton, OH.

“With ServoPro, we realized that if

we were to run the press in a forward/reverse motion using only part of the stroke, we could achieve the necessary production rates for in-die assembly,” Brown says. “Yet, when needed, top-stop would give us immediate access to the tooling, as the technology’s full stroke is quite long.”

Metalstamp, in its 25th year of business, primarily serves the automotive industry as a second- and third-tier supplier producing components and assemblies for items used in engine-control management and in six-speed transmissions now becoming popular among OEMs. The contract stamper

provides design work, builds prototype tooling to verify overall design, and offers engineering support, manufacturing and custom packaging. Metalstamp produces components from a variety of materials including engineered aluminum inlays, plated precious metals, copper alloys, beryllium coppers, and stainless and cold-rolled steels, using presses from 30 to 220 tons.

Gap-Frame Servo Presses Hit the Floor

Metalstamp meets stringent customer requirements with continuous-improvement initiatives that allow its engineers and craftsmen to approach metalforming in new ways. To do so, it relies on innovative metalforming technology and equipment. Among its claims to fame: electronic roll feeds to minimize setup time and prevent mis-feeds; and in-die sensing to ensure long tooling life and measure critical dimensions. ISO 9001-2000 registered, the firm offers customers a full submission package that includes potential failure-mode and effects analysis and a process-control plan.

Having evaluated servo-press capabilities, Metalstamp installed, in 2005, an Aida model NC1-1500 (150-ton capacity) gap-frame press equipped

with ServoPro technology. A year later, to meet its growing requirement for in-die assembly, it purchased a second ServoPro-driven NC1-1500 press. And, in 2007, to take on progressive-die applications, an Aida NS2-2000 (200-ton capacity) straightside press equipped with ServoPro landed in the 50,000-sq.-ft. Metalstamp facility, located just 35 miles from Chicago.

“With our conventional straightside presses, in-die assembly sometimes required our operators to stop a press to work on a tool,” Brown says. “Each stop took minutes, but with the ServoPro presses, operators can perform the necessary tasks in seconds.”

Metalstamp found that tool setting also became simpler and quicker with ServoPro’s hand-crank motion that allows the operator to manually progress through the slide motion under full press tonnage. Operators can turn the pulse-generator dial as slowly or quickly as necessary for isolated timing evaluation, rapid movement or synchronization of processing parameters. Also, they can set timing to just a few microns by stroke position. “We can move the ram in very small increments to set the timing for pilot release as well as the feed, sensors and automation,” Brown adds.

Dwell Feature Enables Value-Added Production

Metalstamp runs the ServoPro gap presses and NS2 straightside press as individual work stations. Production volumes are high for components made from high-performance copper, brass alloys and inlay and stripe-plated materials. Using the presses’ fully programmable slide motion and adjustable stroke length, the firm finds that the number of ways that it can program stroke, velocity and dwell profiles allows it to slow the stroke, stop it, reverse it or create any combination required. “As a result of this flexibility,” notes Brown, “we’ve begun to quote jobs we could not have considered in the past, such as pausing at a given point in the stroke to perform laser welding or component insertion.”

Prior to purchasing its new presses, Metalstamp performed high-speed stamping in a conventional straight-side 60-ton press. “With the new gap presses, we can use the dwell feature to run the presses slower during one particular portion of the stroke, which allows us to perform new value-added processes for our customers,” says Brown, “that previously could only be accomplished in post-press operations. Producing more complete parts adds



To take on progressive-die applications, Metalstamp added this ServoPro-equipped 200-ton straightside press. “With our conventional straightside presses, in-die assembly sometimes required our operators to stop a press to work on a tool,” says toolmaker and maintenance supervisor Terry Brown. “Each stop took minutes, but with the new presses, operators can perform the necessary tasks in seconds.”

value for our customers and is key to allowing our company to compete in a global economy.”

While Metalstamp engineers continue looking at new ways to use the technology, Brown says the team also has begun to consider how the technology might help it solve challenges with more conventional stamping operations.

“One of the problems we’ve been able to minimize thanks to the new

servo-based presses is the reverse tonnage generated by the high linear inches of cutting on some of our jobs,” he says. Reverse tonnage can be a press killer. Conventional designs dictate that the press delivers force in a forward motion. With cutting or blanking, the velocity of the punch hitting the material causes it to break like glass. The strike is followed by an instantaneous release of that massive force in the

opposite direction—something conventional presses find difficult to handle. Because ServoPro’s silent blanking motion reduces punch velocity, Metalstamp now can run jobs generating small reverse-tonnage loads on a smaller press while significantly reducing the shock and vibration at the point of material fracture.

In addition to reducing the negative impact on the press, minimizing reverse tonnage also can lead to improved die life and the ability to operate the press much closer to its rated capacity. Changing the crank profile and slowing the ram velocity at the point of blank breakthrough can decrease overall tonnage requirements by as much as 20 percent, and reverse tonnage by as much as 30 percent or more.

Press Flexibility Has Metalstamp Looking Ahead

Metalstamp’s experience with its ServoPro gap-frame presses has prompted the manufacturer to set up its new NS2-2000 D with a bank of solenoid valves (12 each) tied to cam switches, in anticipation of future jobs that might require automated features such as air blowoffs, slug removal or an oiler trigger.

“We find that the design of the gap presses and the NS2 straightside press to be beneficial due to the easy access these presses provide to the die area,” Brown says. Particularly, Brown finds that the NS2’s structure offers very low deflection and overall clearance, creating a stable environment for the dies. “These factors,” he says, “are important to us because of the investment we make in the design and building of tooling for our customers.” **MF**

Seminar: Operating Coil-Fed Presses June 19, Birmingham, AL

This one-day seminar is designed to teach press operators how to recognize when something is wrong with press operations and to provide them with the knowledge needed to act on it. Topics covered include coil changes and feeding considerations, straighteners and levelers, operator maintenance responsibilities, diagnostic and monitoring tools and case studies.