

Servo Presses 2.0:

The Evolution Continues

Tier One automotive stamper serves as an example, while experts share their views on what's trending and what's ahead.

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This 1500-metric-ton servo transfer press stamps a range of HSLA automotive parts. Among them, door-hinge parts, which were moved from production on a mechanical link-motion press to the servo press.

As with any new technology, it takes a while before industry begins to exploit all of its capabilities—and servo drives are no exception. Though more than 20 years have passed since the first servo press was introduced, it wasn't until the use of high-strength materials ramped up about a decade later that stampers began varying speed and dwell using servo-controlled slide velocity. Today, stampers, in conjunction with equipment providers, increasingly approach servo presses as manufacturing systems,

rather than as standalone machines.

The results of this evolution can be seen at Midway Products Group, a Tier One automotive supplier with eight plant locations in Ohio and Indiana, 1600 employees and 135 presses, six of which are large servo-driven machines from by Aida—three 1500- and two 2000-metric-ton servo transfer presses, and one 800-metric-ton progressive die press. Jim Ward, manager of manufacturing at Midway, looks for the company to add servo presses moving forward, though he notes that there

always will be a need for traditional mechanical presses, especially for low-volume, hand-fed operations.

Achieving Multipart Harmony

Since 2013, when Midway received its first two servo presses, achieving optimal coordination between the press-slide motion with transfer automation in transfer applications has been a primary objective, according to Ward. "Our objectives early on involved overcoming the challenges associated with stamping heavy-gauge,



high-strength parts made of high-strength low-alloy (HSLA) steel," he says. "We were experiencing short tooling life, low yield rates, high reverse-tonnage load, excessive heat and structural damage to our presses.

"Six years ago," Ward continues, "servo technology was in its early stages of development. "Even so, we were able

to take some products and increase strokes/min., with servo drives establishing dynamic velocity and a full-rotation press profile. From there, to achieve additional efficiency gains doesn't require only faster strokes/min., but also requires the system to be in multi-part harmony."

For example, creating a dynamic

slide motion profile and coordinating slide motion with the motion of the transfer bars and fingers increases production rates. The slide decreases speed as it engages material through bottom dead center, then increases to

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full velocity before slowing down to a programmed speed through top dead center, allowing the transfer to achieve optimum strokes per minute. The result: optimal throughput because the slide continues moving through the stroke as the press and transfer work together as a coordinated system.

"With servo drives, the contact and draw velocity are infinitely variable, enabling dynamic motion profiles with multiple slow-down windows to allow the transfer system time to do its job," says Ward. "We're able to achieve this with the help of our equipment vendor, Aida-America, who has, over the years, provided many rounds of training for our programmers and operators to ensure optimization."

"Wherever and whenever you have a servo press and servo transfer system, you add complexity," says Shrini Patil, product manager at Aida-America. "You need a proper understanding of



the technology's capabilities to benefit from its flexibility. Stampers must exercise caution when programming a servo transfer because of the varying velocities throughout the cycle. You may have 40, 10 and 80 strokes/min.

at different points. To achieve transfer, you are tracking virtual angles using binary codes, not the real crank angle as you would on a traditional mechanical press. That's our secret sauce."

More Servo, Please

It's safe to say, after listening to Ward discuss the benefits of servo-driven presses, that Midway's future will include more such machines.

"Servo technology," says Ward, "allows our R&D specialists, product designers and die designers to go further with advanced designs and higher-strength steels while eliminating secondary operations." **MF**