

Tier 1 supplier turns auto industry requirement into opportunity

Stamper uses standards for lighter weight, improved quality to take operation to the next level

By J. Ernest Browning

With 50 years of metal stamping expertise under its belt, Speciality Stampings LLC, Adel, Ga., has established itself as a first-, second-, and third-tier supplier to the automotive industry. The manufacturer, QS-9000- and ISO 9002-certified, specializes in metal stamping, roll forming, assembly, and powder painting.

Parts produced range from window trim, grilles, hubcaps, exterior body side moldings, air bag doors, and mirror sash-

es to its most recent additions of bus, coach, and lighting components.

One of its biggest challenges is to meet the auto industry's demands for greater part accuracy and zero defects. To meet these demands, the company needed a press with a larger bed to run thick and thin materials at close tolerances.

After purchasing a press with a larger bed to help meet these goals, the company discovered opportunities to expand into new stamping arenas with the production of 96-inch-long lighting fixtures, which the large bed size made possible.

Choosing a Press

Automakers are looking to make lighter-weight cars. As a result, high-strength, thinner materials are being used more in part production. These high-strength materials often are not as formable. As a result, dies have gotten bigger and longer, which requires a press that can hold more die stations and has a higher tonnage rating. Therefore, Speciality Stampings knew it needed a bigger press bed to accommodate its needs.

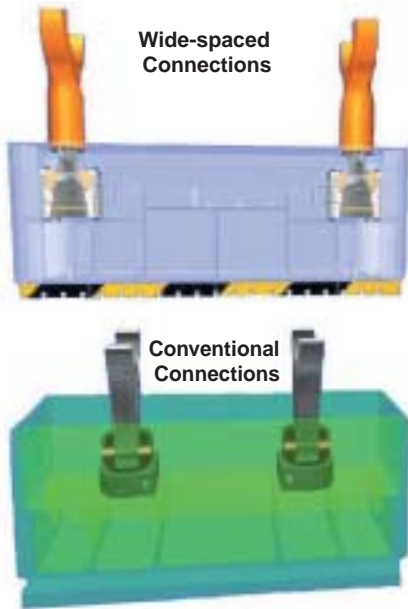


Figure 1

The greater distance between the connection points are designed to increase the stability of the slide to resist the effects of tipping under off-center loads.

In addition, the auto industry’s quality standards have grown progressively more stringent, and these standards are being passed to suppliers like Speciality Stampings. Part tolerances have become much tighter to improve part quality as well as the overall quality of the car.

“The industry is requiring stampers to move toward the use of large progressive dies and multiple stations,” said John Boyd, president of the company. “We also needed to be able to achieve close tolerances and have the ability to run both thick- and thin-gauge materials.”

Over the course of a year, the company researched three stamping press manufacturers and ultimately chose the AIDA PMX-600. The press’s type of link motion helped to increase production by running parts 25 to 30 percent faster than similar presses, Boyd said.

Installed as a stand-alone work center, the press produces 384,000 parts a month from high-strength, low-alloy (HSLA) steel; coil roll, prepainted steel; cold-rolled; and hot-rolled materials. The company runs it 80 to 100 hours a week on a two-shift, five-day operating schedule.

According to Boyd, the 144-in. bed size accommodates larger dies, and wide-spaced connections make it possible to

produce larger, more complex parts without affecting press stability.

The longer dies with more operating stations produce a combination of complexity and length that can make it nearly impossible for stampers to center the loads within the die without increasing design costs. The AIDA wide-spaced connections (see Figure 1) place the connection points toward the outside of the slide. The greater distance between the connection points is designed to increase the stability of the slide to resist the effects of tipping under off-center loads.

Because the PMX-600’s wide-spaced connections are 30 percent farther apart than those on conventional progressive die presses, the press can restrain and minimize the effects of off-center loads, according to Boyd. He said that this was a benefit the company noted once the press was in operation. In addition, part accuracy and die life have improved.

Narrow-based connections sometimes can be less effective at handling off-center loads and can be prone to slide tipping. Wide-spaced connections are designed to provide a more stable environment for progressive or transfer die operations.

Producing a range of parts from telephone booths, seating, ammo boxes, and window components to brackets, lighting fixtures, and bus side panels,

SSI uses the new press to generate high volumes with less die friction and wear. “We also found an advantage with the PMX’s link motion when piercing heavy materials,” said Boyd.

Stamping Heavy Materials

Stampers typically can experience high snap-through when piercing thick materials. AIDA’s specific link drive reduces slide velocity by about 40 percent, according to Boyd, which reduces shock and vibration that result when the punch hits the material. “This is designed to reduce snap-through at the point of material fracture,” Boyd said. Impact load, noise, and vibration have been reduced.

The link motion specific to AIDA also enhances progressive die operations by maintaining the press slide near the bottom of the stroke for a greater period of time (see Figure 2). Its ability to reduce punch velocity and dwell on bottom holds pressure on the workpiece longer. Metal has more time to flow because the material is in the work portion of the stroke about 40 percent longer than with a conventional crank- or eccentric-motion press.

The link motion uses this additional time to allow the part to “set” dimensionally. Boyd said the link drive is able to reduce typical springback and improve

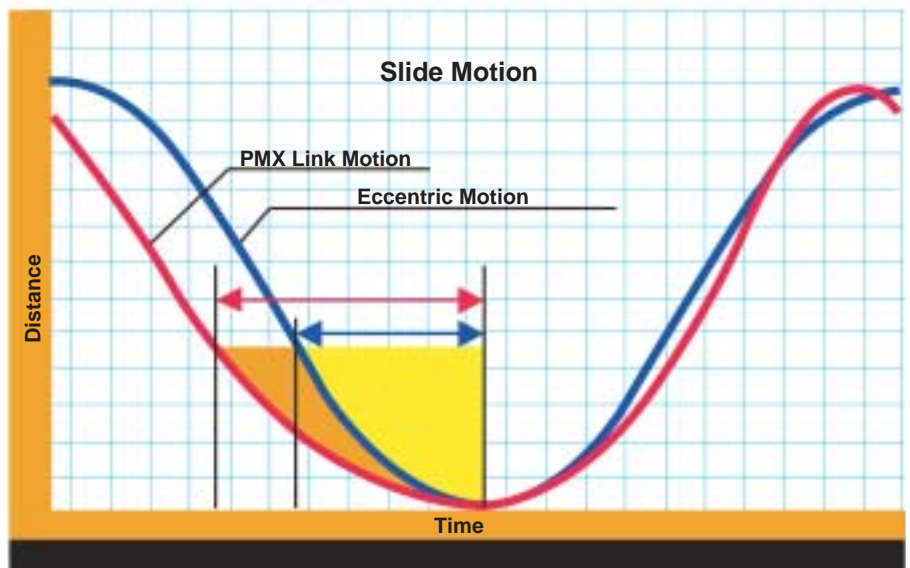


Figure 2

The proprietary link motion also enhances progressive die operations by maintaining the press slide near the bottom of the stroke for a greater period of time.

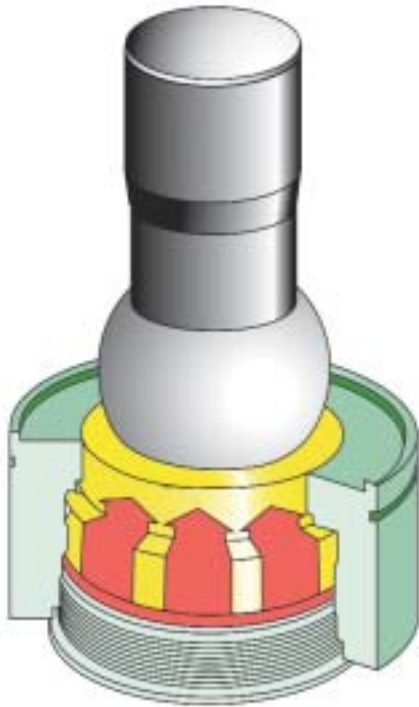


Figure 3

The press's proprietary hydraulic overload protection (HOLP) system is designed to help prevent die breakage, which causes production to stop while the die is repaired.

the part's dimensional accuracy without lengthening overall cycle time. The link drive's modified slide motion allows the slide to regain the extra time spent at the bottom of the stroke as it travels through the nonworking portion of the stroke, delivering improved part accuracy and reduced die cost. As a result, die life has increased 15 to 20 percent.

"Parts such as our seating components require piercing up to six holes at one time," Boyd said. "We found that the link motion improved the true position of the holes." Slower slide velocity means shear amount is greater and break-away less. Increased accuracy translates to tighter part tolerances.

Increasing Die Life

Achieving close tolerances has helped Speciality Stampings maintain its position as a Tier 1 supplier in a competitive industry. Die protection also is critical to maintaining high-volume production deadlines. "With the type of stamping we do, we sometimes experience a die slugging up. If that happens, we don't

have to worry about breaking a die because the PMX's hydraulic overload protection (HOLP) system reacts instantly," Boyd said (see Figure 3).

Overload protection helps improve production rates because stampers avoid breaking complex, expensive dies that stop production while the damaged die is removed, repaired, and put back. For some stampers' applications, this downtime can take days or weeks while the die is being repaired.

Using dies up to 130 in. in length at 20 to 25 SPM for the company's lighting fixture components also is possible. "We now have the speed we need without tearing the die apart—because the link drive allows us to run the job faster but our tooling slower," Boyd said.

J. Ernest Browning is sales engineering manager with Speciality Stampings LLC, 423 N. Mill St., Adel, GA 31620, phone 229-896-2261, fax 229-896-2651. Speciality Stampings LLC is a Tier 1, 2, and 3 automotive stamper.

AIDA-Dayton Technologies Corporation, 7660 Center Point 70 Blvd., Dayton, OH 45424, phone 937-237-2382, fax 937-237-1995, Web site www.aida-america.com.

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