



**ISMR SAYS:** The key to new business, APS has found, can lie in the implementation of new technology

**Focus on automotive**

In 1970, Phil Smith and his father (Albert) opened APS Metal Pressings Ltd in Birmingham (UK). Over three decades later, the family-owned company is a leading worldwide producer of components in volumes of 5,000 batches to 2,000,000 parts annually in a wide variety of material specifications and surface finishes.

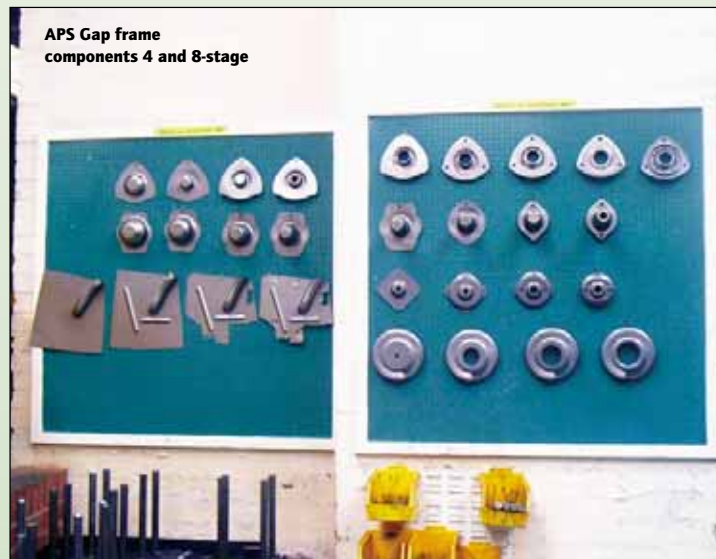
With an innovative approach to process design, development and manufacturing, APS has retained its competitive edge during a lean economy and continues to capture new business. One key ingredient to the company's growth is the advanced stamping press technology provided by AIDA, a global press builder known for its flexible production solutions.

**Maintaining the edge**

APS is based in the Hockley area of Birmingham, which was central to the industrial revolution of the nineteenth century. Its manufacturing facility, totaling over 57,000 square feet of space, produces precision metal pressings, welded assemblies and parts using metal flow forming technologies. APS is also equipped to handle progression, transfer and single operation tooling and recently invested in metal spinning equipment to increase its current range of deep drawn and spun components.

# The key to new business

APS Metal Pressings Ltd. increased production rates, captured new business and created flexible production solutions with innovative press technology



**APS Gap frame components 4 and 8-stage**

**Above: AIDA Gap Line**

**Inset: Phil Smith, Joint Chairman for APS**

APS primarily supports the automotive industry as a second tier supplier to automotive customers. The company also serves the mining, media communications, building and construction industries and law enforcement market. Customers include Delphi Automotive, Ford of America, NSK Steering Systems Japan, GKN Sintered Metals and Nissan Showa Europe.

In addition to continued growth, APS is a past winner of the Accelerate Innovation Supplier of the Year Award for the West Midlands category and is a QS9000 accredited company, with a team of almost one hundred employees.

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APS first tapped AIDA press technology in 1994 when it installed a gap press line.

"The UK was losing a lot of stamping jobs to Spain and Portugal due to businesses being heavily subsidized by government funds," said Phil Smith, Joint Chairman for APS. "We needed a production line that would help us to recapture some of that business."

The AIDA gap press line, which included three 110-tonne gap presses anchored by a 150-tonne gap, was the solution it found.

"The gap press line helped us to eliminate parts handling between operations and reduce the num-

Right: AIDA PMX press

Above: An AIDA PMX component



ber of operators required," Smith said. "It was so successful at helping us increase our business that we installed a second identical AIDA gap press line in 1998 to handle the growth."

The small footprint of the gap press gave APS the flexibility to place the equipment in a unique 'U' configuration to take advantage of existing factory space.

"The eight-gap press line is actually separated in the middle by a wall," Smith explained. "The lines, four AIDA gap presses each, are connected with a special purpose conveyor that moves parts from the first half of the gap press line through an opening in the wall to the other four gap presses."

The AIDA gap press line runs two eight-hour shifts per day and produces a wide range of items including automotive suspension parts, spring seats, upper/lower mounts and steering column parts. The line also accommodates multiple operations.

"Items like the upper mounts we produce for the Honda Civic and CRV models require four draws as well as piercing and trimming," Smith said.

The gap press line contains two turnover stations to accommodate parts that have to be turned 180 degrees to complete processing.

"We also make threaded hole

components," Smith told ISMR. "We purchased threading equipment and turned one of the gap presses into a dedicated tapping station. We can perform multiple combinations on the line or use the gap presses as stand-alone machines. AIDA engineers projected a production rate of 900 parts per hour with the line. We actually achieved a rate of 1200 parts per hour on certain types of components – an improvement of over 30%."

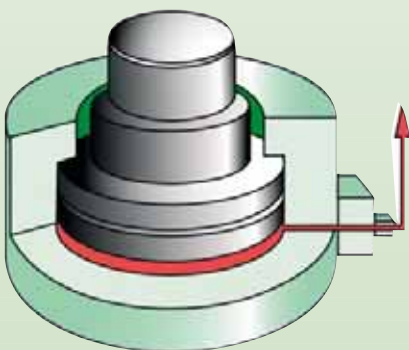
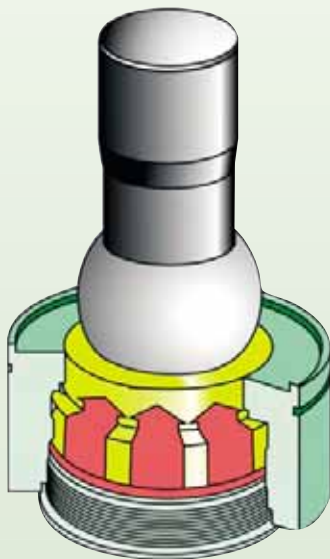
#### Overload protection and link motion

AIDA's NC Series Gap Frame presses have the ability to perform precision transfer work as they feature extremely rigid frames which limit angular deflection under load to one half or less the deflection of other gap presses. Gap transfer presses do not require one end of the product to be consistently connected to the coil during the forming process which allows greater freedom for complex forming operations.

In addition to increasing productivity, APS noted that die maintenance and tooling problems were dramatically reduced. "Mis-locations are now definitely a thing of the past," Smith said.

"Equipped with the fastest Hydraulic Overload Protection System available, our gap frame

Left: Configured to operate as a high speed valve, AIDA's HOLF operates seven to ten times faster than other systems, AIDA told ISMR



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presses offer the lowest bearing clearance and smallest angular frame deflection in the industry," AIDA told ISMR.

"For the customer, these features mean extended tool life and more accurate parts whilst minimizing part burr, noise and vibration."

APS also found the gap press line helped it to reduce man-hours and increase efficiency.

"We found that we could run the line with just one technician," Smith said. As the gap transfer line was able to support key product lines, APS knew that it needed to ramp up tonnage capacity in its progressive die work. "We had parts that needed good definition during forming," he added. "We also needed to increase our tonnage capacity to be able to take on the jobs we previously had to refuse because the largest progressive die press available at the time was a 160-tonne one."

APS purchased a 300-tonne AIDA PMX progressive die press with link motion in 1998. Three years later, the company purchased a second 300-tonne PMX. Both presses operate as stand along work centres running sixteen hours per day and producing up to 120,000 parts per week, depending upon job volumes.

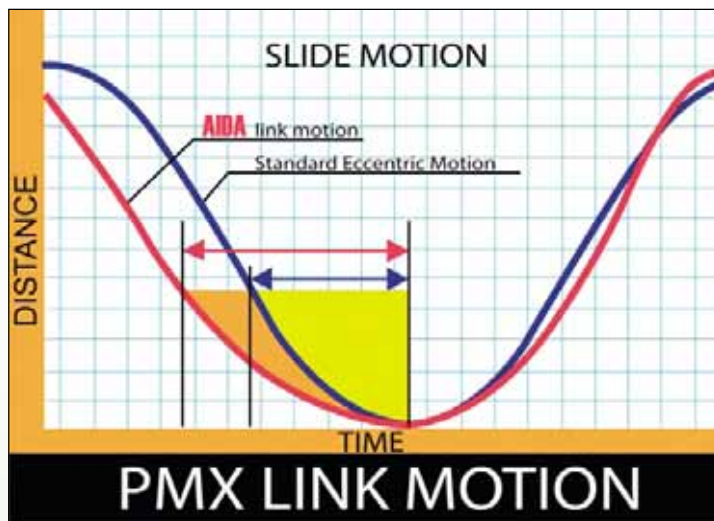
Equipped with coil handling equipment, the second PMX is fitted with an AIDA LFG Feeder Leveller.

However, AIDA's link motion has proved a cornerstone feature for APS.

"We knew the link motion would help us meet our business objectives because the link was ideal for the types of parts we were making," Smith said.

The PMX's unique link motion design enhances metal forming operations in progressive die work by maintaining the press slide near the bottom of the stroke for an extended period of time. Its ability to reduce punch velocity holds pressure on the workpiece for longer. Metal has more time to flow because the material is in the work portion of the stroke

**Right: AIDA's link motion maintains the press slide near the bottom of the stroke for an extended period of time, holding pressure on the workpiece 30-40% longer and improving part stability and accuracy without lengthening overall cycle time**



approximately 30 - 40% longer than with a conventional crank or eccentric motion.

"The advantage of this additional time is that it 'sets' the part dimensionally," AIDA told ISMR. "The PMX link drive dramatically reduces typical spring back and improves the part's dimensional stability and accuracy without lengthening overall cycle time. Its modified slide motion allows the slide to regain the extra time spent at the bottom of the stroke as it travels over the top. The PMX slide motion minimises the heat and vibration found in dies that are run in conventional crank or eccentric shaft presses. The results are better part accuracy and lower die costs."

**Improved production and part quality**

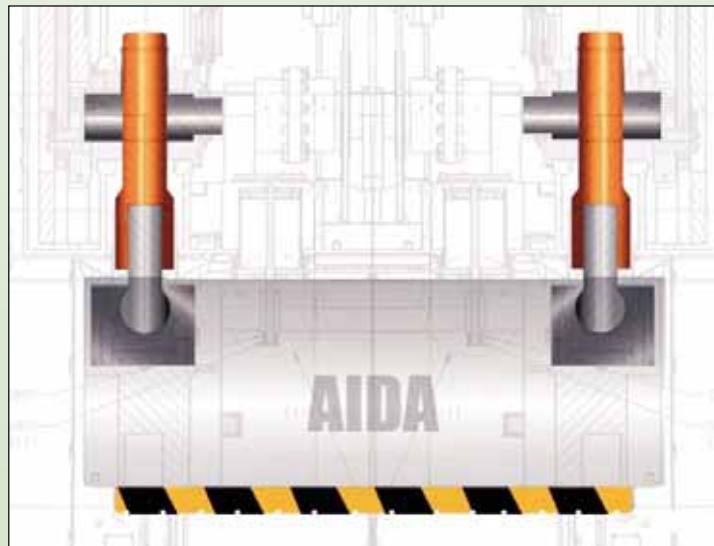
"We increased our tonnage capacity by 100% which allowed us to take new orders for a wide range of parts including blanks," Smith said. "Most of the jobs were for automotive customers but we were also able to do a line of pressings for the mining industry."

APS produces high volume batches of bearing housings for conveyor systems.

"Bearings are highly precise parts with very tight tolerances on the ID," Smith said. "Our housings are manufactured +0/-25 microns."

AIDA's low deflection characteristic allows customers like APS to achieve the close tolerances they

**Right: AIDA's wide spaced connections, 30% further apart than conventional presses, offer greater resistance to slide tipping caused by off-centre loads**



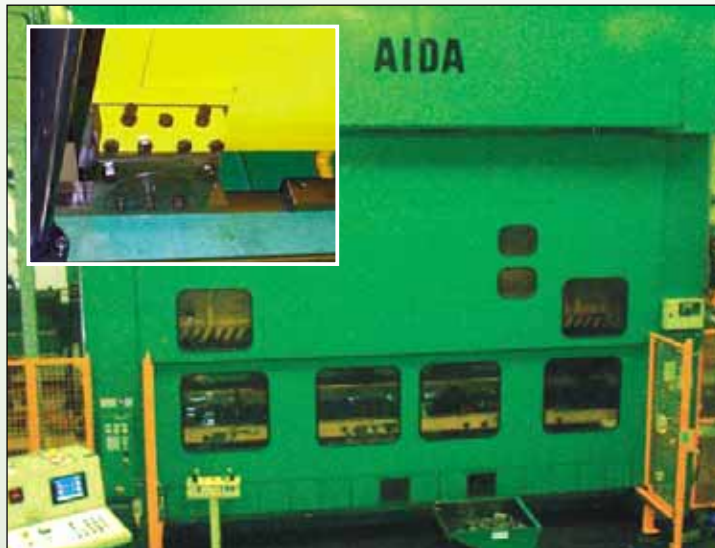
need in precise parts production. The PMX's deflection rating at 1/10,000 mm is as much as one-half lower than the industry standard.

According to Smith, throughput with the PMX presses is superior and tool life and part accuracy have significantly improved.

"Extended die life, improved production and part quality are direct results of our ability to combine link motion with wide-spaced connections and low total bearing clearance," AIDA explained. "Our wide-spaced connections place the connection points towards the outside of the slide. The greater distance between the connection

New growth has continued to keep APS on the competitive edge of the industries it serves. The company has now won orders for parts for the new 2004 Land Rover Discovery. Last year, APS installed a new AIDA large-bed 600-tonne tie-rod straightside NST Series press to support the orders. The NST has been built with rigid construction and is especially suited for multi-purpose job applications and large components.

"We knew that we needed a transfer press to make these parts," said Smith. "This project takes us into a new league in



Above: AIDA NST 600 press. Inset: AIDA's pre-loaded roller slide guides' zero clearance improves performance

points increases the stability of the slide and enables the AIDA system to resist the affects of tipping under off-centre loads. Our wide-spaced connections are at least 30% further apart than conventional progressive die presses making it possible for the PMX to restrain and minimize the affects of off-centre loads."

"Quite frankly, the AIDA PMX is the 'Rolls Royce' of presses. But the proof is in the amount of business we generated. We actually purchased the second PMX to support the increased growth we were experiencing as a result of installing the first PMX," Smith attested.

terms of the types and sizes of parts we are able to produce. We liked the fact that the NST is a new design which could be tailor-made to our specifications. We were also intrigued with the pre-loaded roller slide-guiding feature. It was the first time we had seen an innovation like this."

The key to new business, APS has found, can lie in the implementation of new technology.

"Consumers are demanding more from their vehicles and appliances. A component manufacturer and supplier must therefore offer globally competitive solutions and performance," APS told ISMR.

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## PRE-LOADED ROLLER SLIDE GUIDES



When stampers first began to ask for a press which could produce a mix of conventional and highly cosmetic parts without the contamination sometimes associated with oil film slide guides, the technology did not exist. Lube-less roller slide guides were not a design feature of the straightside press, which was the primary choice for this type of multi-purpose work. Historically, lube-less roller slide guide technology and its advantages have belonged exclusively to high-speed presses.

Following nearly twenty-four months of research and development and liaising with stampers on production needs, AIDA-America designed and built the NST tie-rod straightside press with lube-less pre-loaded roller bearing slide guides as a standard feature. AIDA is the only mechanical press manufacturer to use lube-less pre-loaded roller bearing slide guides on press equipment other than high-speed.

Since pre-loaded roller slide guides are lube free, the potential for oil contamination of a part is eliminated. In addition, the ever-present drip pots used to catch oil from a standard oil film guide, can be removed along with the potential for contamination of the press lubricant by die oil that may splash into the drip pots during manufacturing processes. The die space is also opened up.

Development of a dry slide guide - different from high-speed standard slide guide technology - employs a proprietary roller bearing mount with the ability to swivel. This capability helps the roller to maintain contact with the guide surface on the column during off-centre load situations and addresses another trend for appliance stampers. Increases in operations like in-die tapping and hardware insertion in the die have led to the use of larger dies and more transfer die applications. With zero clearance, the dry slide guide improves slide guiding and its 'pre-loaded' characteristic provides immediate resistance to any lateral slide movement caused by off-centre loads. Standard oil film bearings typically allow some degree of lateral movement, the amount of which depends on how much clearance is available.