REVOLUTIONISING VEHICLE MANUFACTURING TECHNOLOGY WITH HIGH-STRENGTH MATERIALS AND SERVO PRESSES

In the ever-evolving landscape of automotive manufacturing, two key factors drive a significant transformation: the rise of electric vehicles and the lightweighting trend aimed at reducing CO_2 emissions.

Most people agree electric vehicles and the lightweighting trend supporting CO_2 emission reduction target drives revolutionalise vehicle manufacturing technologies. High-strength materials will be widely used in the future to make vehicles much lighter albeit with a higher safety level. As materials become stronger and parts become more complex, traditional presses need to make sacrifices in speed, tonnage, and flexibility — super alloys.

Drawbacks Of Conventional Presses

The primary challenge for metal stampers to use these materials is difficult-to-form characteristics. With traditional presses, stampers may encounter cracks or serious parts springback effect. Despite quality can be controlled, the ideal production rate cannot be achieved. Having a servo press that can be optimised for each part being made allows stampers to be more productive and provide high-quality parts with less equipment. SEYI's servo press can be used in various stamping applications and industries to meet users' unique demands and applications.

SEYI's servo motors and control system's fully programmable press slide motion allows users to optimise the press for every part. The parameters of different slide motion profiles are easily setup on the user-friendly human machine interface (HMI). For example, the slide can move slowly through the working portion of the stroke to prevent cracking of stamped parts but rapidly throughout the rest to improve productivity.

Secondary operations such as in-die piercing can also be implemented into the primary tooling, improving overall efficiency, and reducing costs. 7 default motions and 1 free motion profile in the servo control are provided. From customers' point of view, the most significant benefit that servo presses bring is the flexibility and utility of several different presses all-in-one. The following introduce some of the most frequently used motions.

Link Motion: Programmable And Optimised

Link Motion refers to the slide's ability to move down quickly close to the rating point and descends slowly for "soft touch" with the material. Due to the forming process in low speed, formability can be enhanced and prevent the springback effect. This is a rapid approach with a programmed slide speed slowing at a specified location, which offers increased productivity, better quality, reduced reverse tonnage, and improved tool wear. When forming drawn parts in Link Motion, the quality as well as accuracy can be achieved.

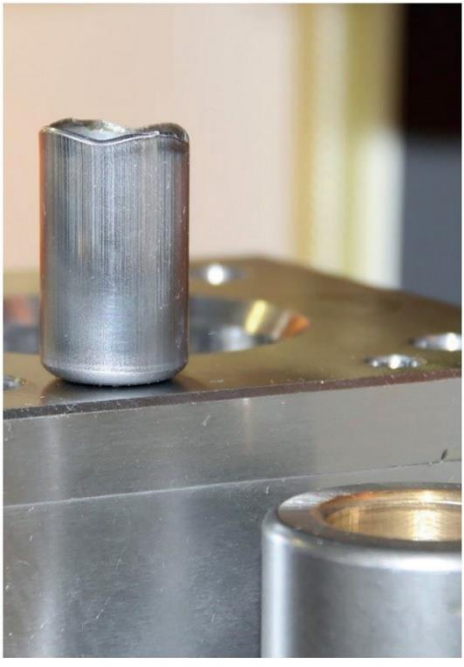
Half Motion: Increased Throughput

Also known as Pendulum Motion, reducing the stroke length of the servo press can eliminate unnecessary press movement, increasing production output and energy saving. For example, by combining progressive die with Half Motion, productivity can possibly be doubled with more than 50% energy savings compared to a mechanical press.

From one global customer, Härter, SEYI received feedback that compared to the previously purchased servo presses, SEYI's servo press under Half Motion for progressive die can increase overall performance, especially the production output with lesser power consumption. The backlog was reduced and high-quality products consistently produced. The various stamping profiles for selection gives Härter more opportunities to reach new markets and develop new stamping operations.

Vibration Motion: Possibility For Reducing The Stages Of Stamping Process

The motion can fulfill the requirements of deep drawing process and at the same time achieve high accuracy and quality. The main benefit is it can potentially reduce the stamping stages for deep drawn parts for higher productivity. This motion is quite suitable for the tapped hole production.



Hold Motion: A Useful Alternative For Hot Stamping

Hold motion pauses the slide motion at Bottom Dead Center (B.D.C.) for a programmed time interval, allowing a heated blank to form and cool with the die. Hot stamping can effectively overcome the two main challenges of advanced high-strength steels (AHSS), especially ultra-high strength steel: difficult to form with excessive spring back.

Traditionally a hydraulic press would be used for a hot stamping line because of better formability and the ability to dwell for an extended time at B.D.C area. Unfortunately, both power consumption and production efficiency are big concerns for metal formers. They translate to higher operating costs.

SEYI has assisted and is still helping Tier 1 auto parts suppliers install several large-tonnage SDE series servo presses for their hot stamping lines across countries since 2019. Compared to its traditional hot stamping processes, production rates can increase at least 20%, operating costs can be reduced up to 50%, and electrical power consumption reduction up to 70%.

As the industry moves towards green and smart manufacturing, these two aspects are critical for manufacturers when they make decisions on equipment investments. SEYI's servo press, with its high efficiency and energy-saving advantage, will not only help metal stampers invest in lesser equipment for more stamping possibilities but also help find out more business opportunities for new stamping applications. For more information on servo technology advantages, please visit www.seyi.com or contact directly via sales@seyi.com.