

Info Special

## Hydraulic servo direct drive for die forging hammers



**LASCO UMFORMTECHNIK**  
**WERKZEUGMASCHINENFABRIK**



# Advantages of the hydraulic servo direct drive - now for die forging hammers and presses

## Servo drive technology is conquering the die forging hammers

The motor of the hydraulic servo direct drive is coupled directly with a hydraulic pump. The positioning of the ram, the adjustment of the speed and thus the setting of the blow energy are carried out exclusively via the servo motor.

The availability of large efficient electric servo drives is giving this drive concept more and more momentum. Since 2008 LASCO has been using the hydraulic servo direct drive successfully for many diverse press applications. With the experience gained it is now possible to adapt this advantageous drive technology to the die forging hammer as well.

Due to the specific differences between the hammer and presses – hammers have high acceleration forces with corresponding large stresses on all components – this was quite a challenge for our engineers. It was LASCO's aim to develop the drive of the die forging hammer to the degree that the basic characteristics of a hammer could be maintained while reaching the highest energy efficiency and longevity at the same time.

## Highly dynamic and robust

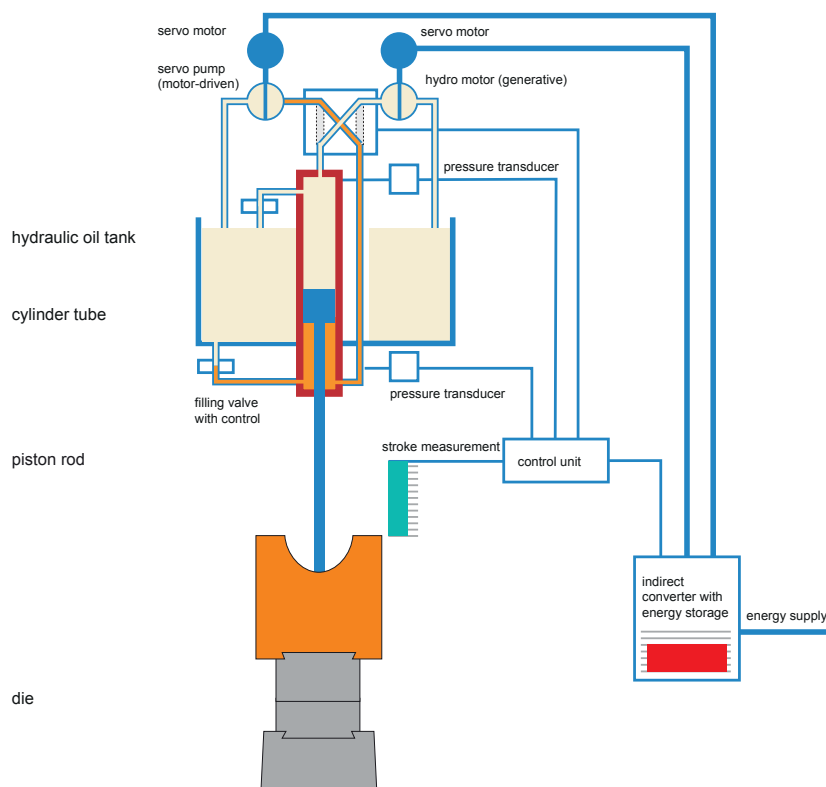
The axial piston pumps of the new drive, which are designed as constant pumps, are driven reliably by highly dynamic servo motors. But still the new technology cannot do completely without hydraulic valves. Safety functions regulated by law or the filling of

large cylinder cavities with quick movements require valves that can be switched and also controlled. In addition the safeguarding of the pressure circuits against a maximum value must also be maintained. However, the clear and neat structure of the hydraulic components increases the ease of service and maintenance many times over compared with conventional drives, and troubleshooting can be carried out much more easily and quickly.

The accumulators, which are considered as being critical with regard to their energy efficiency anyway, can be omitted completely in case of the „servo hammer“. Converters with intermediate circuit and energy storage are used instead. This is an essential progress compared with the conventional hydraulic double-acting drive. LASCO's consequent further development of hydraulic drives and the resulting benefits for users of this technology all over the world are guarantors of the successful application of the forming unit in the future.

## Design of the servo direct drive

At first glance, the new drive differs only little from conventional solutions. The only thing that can be seen is that there are no accumulators on the drive head. The decisive modifications become obvious only on closer examination: A fixed-displacement pump, driven by a servo motor, is used for the generation of pressure and oil volume flow. Through four cartridge valves the required oil quantity is either led to the piston side for blowing or to the rod side of the piston during the upward movement of the ram.



Hydraulic servo direct drive

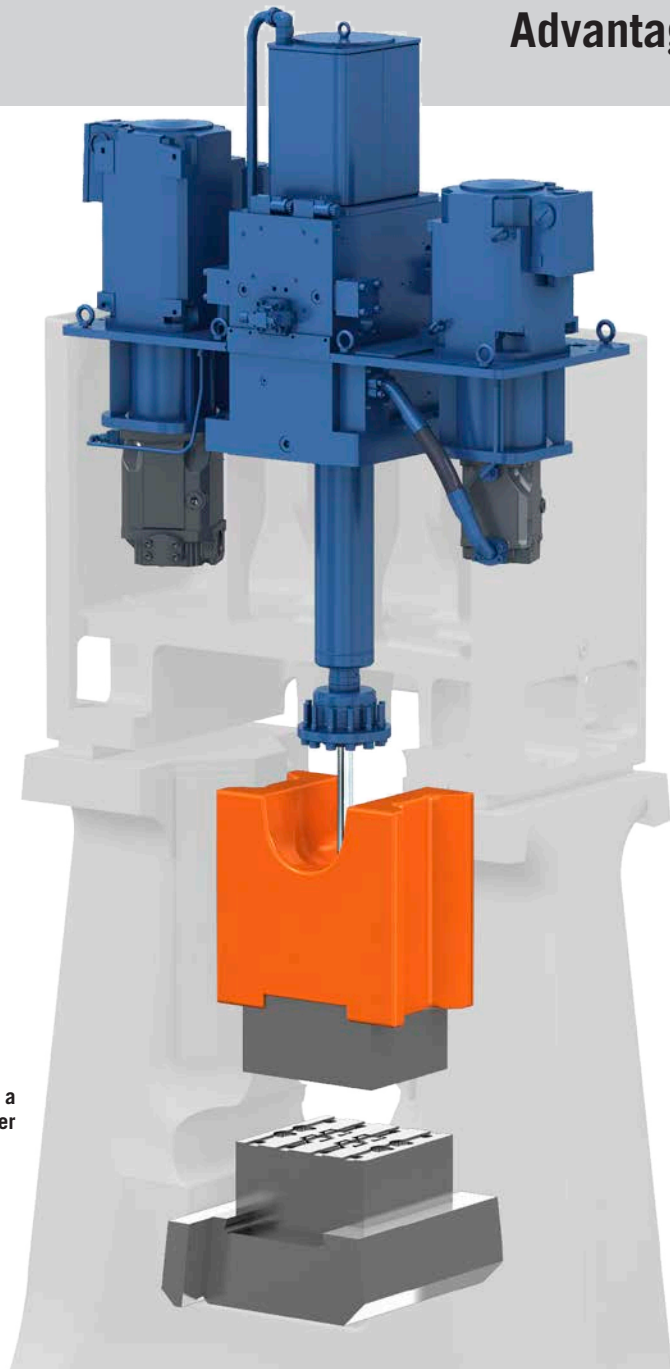
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## Advantages

Another servo motor is constantly used as a generator at the same time. The displaced oil from the piston side during the return or from the rod side during the blow drives the hydro motor, which in turn drives the servo motor as a generator. With this principle, energy is constantly fed into the intermediate circuit and is available for the next movement.

Due to the special connection of the cartridge valves, a particular blow valve is no longer needed.

Servo direct drive of a  
LASCO die forging hammer



## The advantages at a glance

- Excellent controllability of the servo motor with regard to speed, torque and position
- Very easy service and maintenance
- Much better energy balance due to a degree of efficiency of the servo motor of  $>90\%$  ( $\cos \phi = 1$ )
- Standstill of the servo motors and pumps during standstill of the die forging hammer (no energy consumption)
- Simplified diagnosis due to clear drive design
- All setting data allow digitized storage and documentation

## **www.lasco.com**

### Headquarters:

LASCO Umformtechnik GmbH  
Hahnweg 139  
96450 COBURG  
GERMANY  
Phone +49 9561 642-0  
Fax +49 9561 642-333  
Mail lasco@lasco.de  
Internet www.lasco.com

### LASCO France

Thierry Lebailly  
1, allée des Cèdres  
78860 SAINT NOM LA BRETÈCHE  
FRANCE  
Phone +33 1 3080-0528  
Fax +33 1 3080-0584  
Mail thierry.lebailly@lasco.de

### LASCO USA

LASCO Engineering Services L.L.C.  
615 Harbor Avenue  
MONROE, MI 48162  
USA  
Phone +1 734 241-0094  
Fax +1 734 241-1316  
Mail lasco@lascoUSA.com  
Internet www.lascoUSA.com

### LASCO China

LASCO (Beijing) Forming Technology Co. Ltd.  
Huateng Tower, Unit 1706A  
Jia 302, 3rd Area of Jinsong,  
Chaoyang District  
100021 BEIJING  
P.R. CHINA  
Phone +86 10 8773 0378  
Fax +86 10 8773 0379  
Mail lasco.beijing@lasco.de