

FORMING THE FUTURE



HYDRAULIC PRESS SYSTEMS  
FLEXIBLE AND EFFICIENT



Hydraulic transfer press to manufacture truck components.

# FLEXIBLE AND EFFICIENT. HYDRAULIC PRESS SYSTEMS.

---

- 4 SINGLE PRESS SYSTEMS  
Flexible application for a wide range of parts
- 5 TRANSFER PRESSES  
Enhancing Profitability Step by Step
- 6 PRESS LINES  
Efficient high volume production in the automotive and tier industries
- 7 SPOTTING AND TRYOUT PRESSES  
Safe testing and tryout of tools
- 8 MANUFACTURING SYSTEMS FOR PRESS HARDENING APPLICATIONS  
Reliable manufacturing of high-strength components
- 9 SYSTEM SOLUTIONS FOR HYDROFORMING APPLICATIONS  
Series-proven solutions from the pipe to the ready-to-install part
- 10 PRESS SYSTEMS FOR FIBER-REINFORCED PLASTICS  
The future is light
- 11 ISOTHERMAL FORGING PRESSES TO MANUFACTURE TITANIUM COMPONENTS  
Weight reduction and efficiency in focus
- 12 HOT FORMING PRESSES FOR SHEET METAL APPLICATIONS  
Designed for complex geometries
- 13 SYSTEM SOLUTIONS FOR LONGITUDINALLY WELDED LARGE PIPES  
Large pipe manufacturing
- 14 SCHULER SERVICE

# FLEXIBLE APPLICATION FOR A WIDE RANGE OF PARTS.

## HYDRAULIC SINGLE PRESS SYSTEMS.



Automated hydraulic system solutions.



Single press system with robot automation.

**Efficient and reliable.** Hydraulic single press systems can be loaded or unloaded manually or automatically. In combination with coil lines, destackers / blankloaders or tri-axis transfer systems, they can be used to create turn-key system solutions for cost-effective part production. Equipped with hydraulic bed cushions, cutting shock dampening, slide parallelism control and dynamic cylinder mode switching, hydraulic presses meet all the requirements for efficient production in the stamping plant. A data analysis system supports the press operator with straightforward fault diagnostics of the entire system and helps raise productivity.

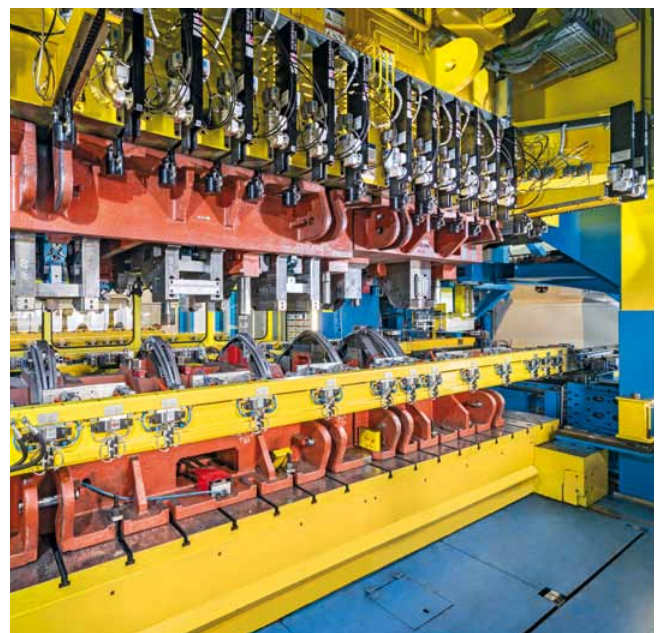
#### The advantages:

- Alternative manufacturing process for a wide range of parts including aluminum, stainless steel and ultra-high strength materials
- High flexibility in production
- Ease of operation thanks to user-friendly slide control
- Superior part quality with cutting shock dampening and hydraulic bed cushion
- Parallelism control increases part quality and protects the dies
- Efficient manufacturing using innovative hydraulic components and energy management solutions
- Increased parts accuracy by multi-point hydraulics

# ENHANCING PROFITABILITY STEP BY STEP. HYDRAULIC TRANSFER PRESSES.



Hydraulic transfer press with 12.000 kN capacity.



High volume production of truck components on a hydraulic transfer press.

**High output rates.** In combination with tri-axis transfer systems, hydraulic transfer presses enable part production on multi-station transfer dies. High throughput rates can be achieved with innovative hydraulic solutions, such as Schuler ring valve technology and dynamic cylinder mode switching. In single-slide or multi-slide design (with options for one or more bed and / or slide cushions) the capacity range for these presses ranges from 5,000 up to 30,000 kN (550 to 3,375 US tons). The active electro-hydraulic slide parallelism control and hydraulic impact shock dampening functions ensure superior part quality and reliability in the forming process. Other auxiliary functions can be integrated directly into the die.

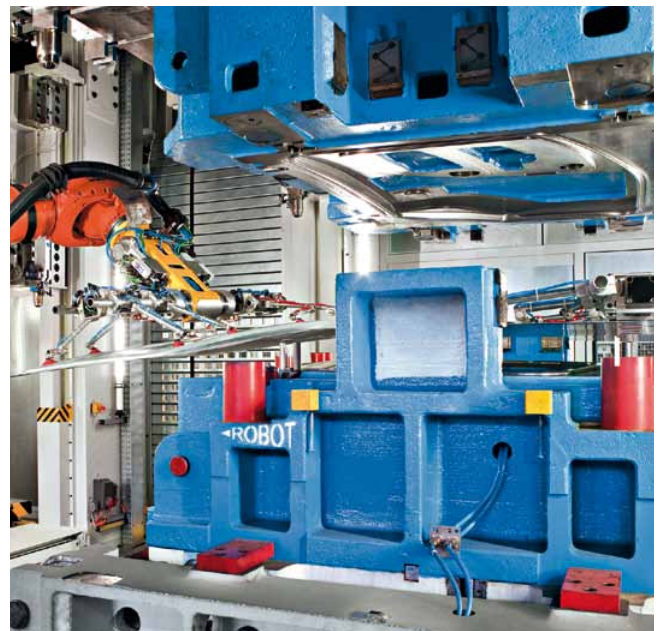
#### The advantages:

- Simple changeover to different dies
- Freely programmable motion characteristics
- Speed and press force are programmable
- Deep-drawn parts can be manufactured cost-effectively with a counter-drawing process
- Nominal capacity available over the entire press stroke
- Easy set-up for new dies
- Superior quality of parts due to parallelism control

# EFFICIENT SERIES PRODUCTION. HYDRAULIC PRESS LINES.



Hydraulic press line with blank loader automated by robots.



Hydraulic press lines with crossbar robot automation.

**Flexible high volume production.** Hydraulic press lines are mainly used to manufacture a wide variety of parts in small to medium lot sizes. Depending on the required forming operations, the line typically consists of between four and six single presses. The production process is fully automated from the blank to the finished component. Depending on the requirements, automation is provided by either conventional robots or Schuler Crossbar Robots. The control and visualization systems of the hydraulic press lines provide a user-friendly operation environment. They also feature efficient fault diagnostics and clear administration of all the process and die data for presses and automation systems.

#### The advantages:

- Easy and quick integration of new dies sets
- Schuler's dynamic cylinder mode switching and ring valve technology increases production rates
- Tooling and die automation ensures fast changeovers
- Precise slide guiding and rigid press frame
- Uniform control concept
- User-friendly operation and efficient fault diagnostics
- Fast start-up of new die sets

# TRYOUT UNDER NEAR-PRODUCTION CONDITIONS. HYDRAULIC DIE-SPOTTING AND TRYOUT PRESSES.



Tryout center with hydraulic tryout presses.



Focus on part quality.

## Manufacturing components reliably in production.

Hydraulic tryout presses ensure short tryout phases by providing conditions very close to real-life production. The operator has the full-rated capacity available anywhere in the stroke, and can lower the upper die precisely onto the lower die as required. Sizes, performance specifications and auxiliary equipment are all tailored to customer needs for die testing and pilot lot production. Capacities range from 1,250 up to 25,000 kN (150 to 2,800 US tons). Multicurve presses – equipped with a hydraulic accumulator drive – simulate the slide motion of hydraulic and mechanical production presses.

## The advantages:

- Programmable speeds and press forces
- Slide return stroke possible at any point
- Sensitive control of slide motion by means of joystick
- Full-rated capacity available over the entire stroke
- Simple adjustment to different die heights
- Double-action presses: Operation possible in single-action or double-action modes
- Provides the same rigidity as production presses
- Die cushion technology as in production presses ensures optimum start-up results.

# PROVEN IN SERIES PRODUCTION. MANUFACTURING SYSTEMS FOR PRESS HARDENING WITH PCH TECHNOLOGY.



In the press hardening center of excellence, Schuler is consistently working at further development of the process.

**Proven in series production.** Press hardening (hot stamping) is a process used to manufacture high-strength components. In this process, the parts are hardened through heating, forming with hydraulic presses and controlled cooling in the die. Steels with starting tensile strengths of 500 to 700 N / mm<sup>2</sup> achieve strengths of 1,300 to 1,600 N / mm<sup>2</sup> during the process. After heating, robots or transfer systems transport the hot components into the die of the hydraulic press. Controlled cooling takes place in water-cooled dies. The required capacity of the hydraulic presses can range from 8,000 to 16,000 kN (900 to 1,800 US tons). The finished parts are trimmed in mechanical presses or laser cells. Schuler has developed



System solutions for high-volume production with PCH technology.

a cost-effective system solution with PCH technology (Pressure Controlled Hardening) for press hardening covering the entire process.

#### The advantages:

- Greater tensile strength with reduced component weight
- Improved rigidity of the auto body
- Improved crash characteristics
- New possibilities for component design
- Consistent final material properties for quality components
- Use of less costly material instead of high-strength steels
- High press forces not required



# SERIES PROVEN. SYSTEM SOLUTIONS FOR TUBULAR HYDROFORMING APPLICATIONS.



High volume production of structural parts using the hydroforming process.

## The tubular hydroforming process offers vast possibilities.

There is a large variety of possibilities for hydroforming. It is used in automotive design where light weights, design freedom and structural strength are needed. It also provides opportunities to reduce multiple joined parts into one formed component. The process is used to form exhaust, chassis and structural components. Schuler provides design support, component analyses, feasibility studies, prototyping, dies and full scale part production – all from a single source. The process of hydroforming under supporting pressure also allows the use of higher-strength steels.



Side members manufactured by tubular hydroforming.

## The advantages:

- High component rigidity and strength
- Low component weight
- High material utilization
- Integration of additional functions in the components
- Maximum repeat accuracy
- High component quality and long service life by avoiding welds
- Greater freedom of design for complex components and streamlined designs

# THE FUTURE IS LIGHT. PRESS SYSTEMS FOR FIBER-REINFORCED PLASTICS.



Hydraulic press for manufacturing fiber-reinforced plastics at Schuler SMG in Waghäusel, Germany.

**Minimal part weight.** Fiber-reinforced plastics offer a great deal of scope for design, as well as minimum component weight. These advantages are also proven in autobody production. Schuler hydraulic press systems deliver innovative solutions for high volume production of fiber-reinforced plastics, and meet the most demanding requirements for component production. Hydraulic press systems are suitable for series production of SMC (sheet molding compound) components, GMT (glass mat thermoplastics) components, and RMT (resin transfer molding) components. The result: Best parts quality and maximum production reliability – for greater economic efficiency and maximum productivity.



Manufacturing cell for fibre-reinforced components automated by robots.

## The advantages:

- High rapid motion speeds, short pressure buildup times and active ram parallelism control for high-quality components with small wall thicknesses
- Controlled speed profiles in the press process for greater flexibility in component production
- Press configuration with optimized deflection properties in order to achieve uniform wall thicknesses
- Roll guiding of the ram with deactivation function for freedom of slide motion in the press process
- Separate cylinders for both slide parallelism control and smooth die opening without damage to the component
- Accumulator drives for efficient energy use

# WEIGHT REDUCTION AND EFFICIENCY IN FOCUS. ISOTHERMAL FORMING PRESSES FOR TITANIUM PARTS.



Isothermal forming press.

**Efficient forming of titanium.** In cooperation with FormTec, Schuler developed a new generation of presses. Innovative heating and insulation elements guarantee even heat distribution and high surface quality. Low external temperature reduces stress on machine elements and increases operator safety. High quality construction of all press components with a precise press force profile plus finely adjustable speed and precise guide systems increases component quality, guarantees high reproducibility and extends die service life.



Heating chamber in a isothermal forming press.

During configuration of the manufacturing systems, special attention is paid to the requirements of the aviation industry. Specific requirements such as small batch sizes, typical cycle times for titanium forming and high quality requirements in terms of temperature tolerance or surface quality can be met.

# FOR COMPLEX GEOMETRIES. SYSTEM SOLUTIONS FOR HOT DEEP DRAWING OPERATIONS.



Hot forming cell with hot press, pre-heating furnace for dies and parts manipulator.

**New generation of hot forming presses.** Schuler and FormTech GmbH have created a partnership called “Titanium Forming Alliance” in order to offer a new generation of hot presses to the aviation and aerospace industry. FormTech has outstanding know-how in this field – from the development of forming technologies, dies and part design through prototype manufacturing and small series production as well as mass production.

Machines from Schuler allow for the cost-efficient production of sheet metal components using the following processes:

- Gas pressure forming (SPF)
- Diffusion bonding (DB)
- Hot forming/calibrating
- Hot deep drawing

Significant advantages in terms of cost and productivity can be achieved by hot forming of titanium sheets. For example, the buy-to-fly ratio of valuable titanium raw material is significantly improved. Manufacturing complex part geometries in one forming step reduces the costs of material, logistics and installation and reduces production time.

**The advantages:**

- Long service life of machine components
- Innovative heat chamber design
- Low heat loss – improved energy efficiency
- Precise temperature control
- High productivity
- Repeatable high part quality
- Precisely controlled drawing cushion (for hot deep drawing)

# MANUFACTURING LARGE PIPES. SYSTEM SOLUTIONS FOR LONGITUDINAL WELDED PIPES.



J-press for the step forming process in conventional design.

**Large pipes.** As a leader in forming technology, Schuler uses innovative hydraulic press technology for manufacturing large pipes. Whether as an individual press or fully integrated into a complete pipe plant: hydraulic presses from Schuler provide a decisive competitive edge when it comes to manufacturing longitudinally welded large pipes. Schuler uses two technologies for manufacture:



The new Schuler LFJ- hydraulic pipe forming press .

## System solutions with the UOE process.

- For this process, we supply crimping presses (C-presses), U-presses and O-presses.

## Lines with the step forming process.

- We supply crimping presses (C-presses) and J-step forming presses for the step forming process.

Pipe lengths up to 18 m (60 ft) and more can be achieved on our hydraulic large pipe presses. The diameters are up to 1,625 millimeters (64 inches), the wall thicknesses up to 65 millimeters (2.5 inches).

## SCHULER SERVICE. OPTIMUM SERVICE FOR MORE PERFORMANCE.

Schuler Service offers a tailored portfolio of services covering the entire life cycle of your equipment.

---



Schuler Service – Customer-oriented, efficient, worldwide.

EXPERTISE

PARTNERSHIP

PRODUCTIVITY

SAFETY

FUTURE

Over 900 service employees worldwide provide expert support 24/7 in close cooperation with you – our partners. Our main priority is always to ensure the ultimate productivity and safety of your production equipment in order to secure your company's continued success.

With over 170 years of experience and expertise, we can guarantee the best possible support for the operation of your machines – and not only those supplied by Schuler, but by all other manufacturers. Whatever the situation, Schuler Service has the right solution for your specific needs.

## OUR SERVICES FOR YOU.

### Technical Customer Support:

- Machine inspections
- Safety inspections
- Preventive maintenance
- Repair
- Repair welding
- Production support

### Components and Accessories:

- Spare parts and spare part packages
- Maintenance kits
- Repair parts
- Replacement parts

### Project Business:

- Modernization
- Retrofits
- Refurbishment
- Machine relocations

### Special Services:

- Service contracts
- Hotline and remote service
- Training
- Tailored customer training
- Optimizing plant & processes
- Consulting

### Used Machinery:

- Purchase and sale
- Evaluation

## SCHULER SERVICE ONLINE



Want to know more about our full range of services?

Simply scan the QR code with the camera of your smartphone or tablet.

[www.schulergroup.com/service\\_uk](http://www.schulergroup.com/service_uk)



[www.schulergroup.com/hydraulic\\_press](http://www.schulergroup.com/hydraulic_press)

For more information, simply scan the QR code  
with the camera of your smartphone or tablet.

**Schuler SMG GmbH & Co. KG**

Louis-Schuler-Straße 1

68753 Waghäusel

Germany

Phone +49 7254 988-563

Fax +49 7254 988-339

Schuler Service Phone +49 7254 988-379

Schuler Service Fax + 49 7254 988-361

[info@schulergroup.com](mailto:info@schulergroup.com)

[www.schulergroup.com](http://www.schulergroup.com)