

FORMING THE FUTURE



## HYDRAULIC TRYOUT PRESSES

# HYDRAULIC TRYOUT PRESSES. TRYOUT AS SUCCESS FACTOR.



Modern tryout systems enable die start-ups in production-like conditions.

Complex forming processes, new materials and demand for the highest levels of economy and efficiency characterize the stamping plants of today's automobile- and supplier industry. The continuous expansion of the number of models also increases the required number of die sets. To keep the start-up costs of new die sets as low as possible it is important to bring the dies up to speed for volume production quickly and efficiently. Schuler tryout systems are custom-tailored to meet this requirement. The equipment and the expertise of your engineers ensure an optimal die start-up.

**Short start-up times for new dies.** In the modern stamping plant, tryout presses are no longer optional, instead they



Hydraulic tryout presses reduce costly downtimes.

are essential components of a sequence that includes component simulation > manufacture of dies > start-up > production. The interplay between press, die, material, and lubrication is so complicated that pure simulation cannot replace the actual tryout process. The use of intelligent tryout concepts reduces costly downtimes in production lines.

**Production-like tryout conditions.** Advanced tryout systems permit the start-up of large dies under conditions close to actual production values. The dynamics of the equipment in the forming process can be simulated, as can the characteristics of the drawing systems found on mechanical and hydraulic presses.

## YOUR BENEFITS:

### Flexibility

- Varying die heights, drawing depths, and drawing forces are possible.

### Work energy

- Total press force is available over the entire slide stroke.

### Drawing speed

- The drawing force and drawing speed can be varied by means of the hydraulic control.

### Ergonomic design

- Optimal access to the die.

### Press force regulation

- Press force can be limited for smaller dies.

### Multicurve-drive

- Permits simulation of the slide speed and the dynamics of a variety of mechanical and servo-mechanical production presses.

### Multi-point drawing cushion

- A multi-point drawing cushion permits simulation of advanced production presses that are now commonly equipped with multi-point technology.

### Moving bolster

- Reduces changeover times.
- Improves accessibility.



Tryout systems provide maximum flexibility.

### Adjustable stroke limitation

- Start-up of dies without the need for fixed stops on dies.

### Spotting control

- Sensitive control of slide up and down movement using a joystick.

### Infinitely variable slide locking

- Permits safe and ergonomic reworking on upper dies.



Hydraulic tryout presses in the die shop.



Multicurve tryout presses with rotating slide plate and moving bolster.

### MULTIPLE APPLICATIONS

Tryout presses close the gap between die manufacturing and part production. They simulate the production lines during die manufacturing or just before actual production in the stamping plant – whether as a simple die spotting press, flexible tryout press, or as a complete tryout center with various press types, moving bolsters, and die turnover devices.

### TRYOUT DURING DIE MANUFACTURING

Hydraulic tryout presses are easy to operate, easily accessible, and permit ergonomically correct work to be performed on the dies. The main activities here are die rework and die spotting, for which the characteristics of hydraulic presses are very beneficial.

### PRODUCTION OF PROTOTYPE PARTS

In order to produce prototype parts from a wide variety of materials, you need a high degree of flexibility with regard to stroke and shut ratios as well as the necessary forces for a large number of parts and dies. For the cost-efficient manufacture of small batch sizes and best-possible usage

for die construction, quick changeover is crucial. Setting up new dies should be fast and easy in order to produce “pass parts” as quickly as possible. Generously dimensioned slide and bolster cushion strokes offer flexibility for the use of different dies. For the production of prototype parts, the hydraulic press can fully utilize the benefits of a force-related system and quickly leads to the desired part quality.

### SINGLE PRESSES OR TRYOUT CENTER?

As opposed to single presses, complete tryout centers ensure the highest levels of flexibility. Depending on the application they include the various press types as well as die turnover devices and revolving beds. The processing of dies, often very time consuming, can take place away from the tryout presses. The various lines can be connected by means of moving bolsters on a rail system.



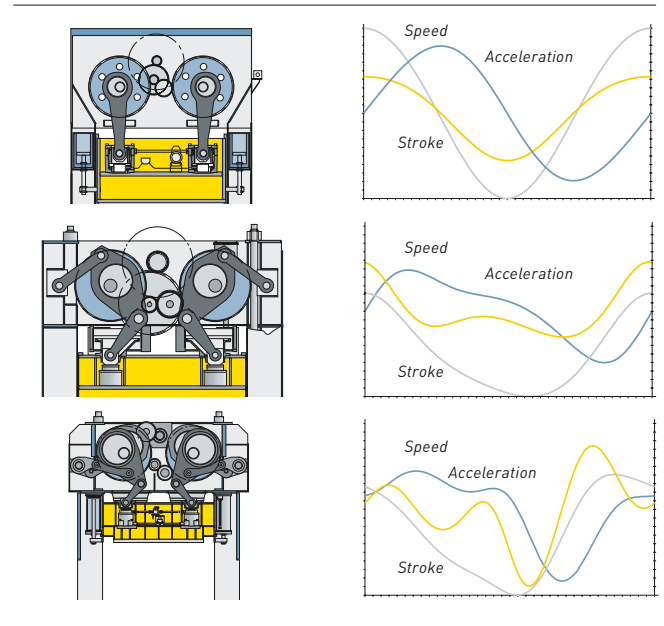
Multicurve tryout press for simulating all press types.

#### DRIVE CONCEPT "SPEED"

Schuler has developed a drive concept to increase the forming speed in tryout operations, which is tailored to the specific requirements of the tryout process. When used on prototyping and tryout presses, significantly higher forming speeds are obtained in an economical way without requiring a multi-curve drive system. The sophisticated deep drawing process can be adjusted even better to the actual conditions of the mostly mechanically driven production presses.

#### ADVANTAGES OF HYDRAULIC MULTICURVE-TRYOUT PRESSES

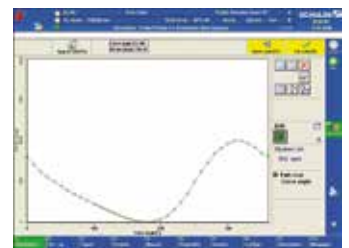
- Simulation of widely varying press types via programmable slide motion characteristics.
- Simulation of the impact shock during closing of the dies.
- Drawing speeds up to 500 mm/sec via accumulator drive.
- User-friendly management of up to 200 profiles.
- Use of a bed cushion with or without pre-acceleration.



Simulation of different slide kinematics.

#### MULTICURVE-DRIVE

To achieve exact simulation of the forming processes of mechanical production lines, hydraulic multicurve tryout presses simulate various slide motion characteristics. They are entered once and then saved. It is easy to import the data. For the exact simulation of the forming processes characteristic of mechanical and servo-mechanical production lines, the multicurve tryout press is designed to achieve speeds of up to 500 mm/sec. The hydraulic multi-point drawing cushion in the press bed also simulates the functions of drawing cushions in modern production set-ups and provides tryout conditions as close as possible to actual production.



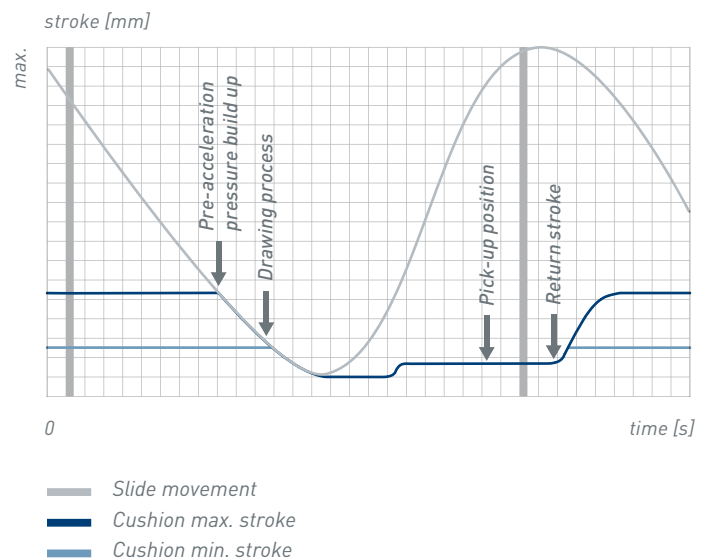
# TECHNICAL EQUIPMENT.



Hydraulic tryout presses are the key to fast die start-up.

## MULTI-POINT BED CUSHION

In order to utilize a tryout press universally, a hydraulic drawing unit is required in the bed cushion. The unit should be able to cover the wide range of cushion technologies used in current production processes.



Hydraulic bed cushions offer maximum flexibility.

During the drawing process the bed cushion force is transmitted from the displacement cylinders via pressure pad and pressure pins to the blank holder of the drawing die. Real time regulation and servo-proportional valve technology provide the highest levels of dynamic response and control function. A multi-point cushion control is available as an option. The feature allows the force of each individual displacement cylinder to be programmed independently over the entire drawing depth. Bed cushion pre-acceleration is also available as an option.



Moving bolsters for easy die change.

### STROKE LIMITATION

A mechanical stroke limitation for die spotting is particularly recommended for dies with narrow depth tolerances. In this way, dies without separate fixed stops can be made production-ready.

### COVERS FOR SLIDE GUIDING

To protect the slide guidings from contamination, such as grinding particles, during die rework, the guidings are provided with metallic telescopic covers below the slide.

### DIE SPOTTING MODE

By preselecting the operating mode “die spotting” on the operating mode selection switch, a separate hydraulic circuit is activated, which permits an extremely sensitive up and down movement of the slide.

## FURTHER TECHNICAL EQUIPMENT



Stroke limitation.



Covers for slide guiding.



Die spotting mode.

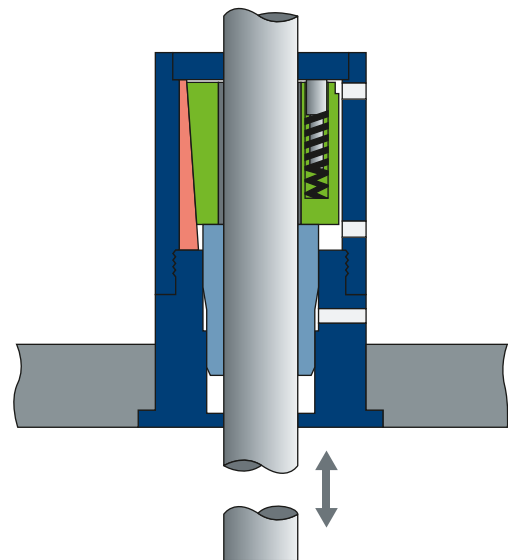
## TECHNICAL EQUIPMENT.



Operator-friendly control.

### SLIDE PARALLELISM CONTROL

The tilt of the slide – caused by asymmetrical process forces – can be adjusted to the tilting behavior of mechanical production presses by means of an active electro-hydraulic parallelism control system.



Infinitely variable slide locking.

### INFINITELY VARIABLE SLIDE LOCKING

With this feature the slide can be mechanically locked over the entire stroke range. In this way, rework can be performed on the upper die at the ergonomically optimum height. Locking is performed by a positive locking system using wedge elements and is electrically monitored. Release is performed hydraulically. The locked status of the slide is displayed by a light panel on the press upright and on the operator's panel.





Flexible cover over the press bed.

#### BOLSTER COVER

For protection of the bed cushion, a flexible cover is drawn over the press bed while the moving bolster is moved out. The cover is made of slip-resistant material and can be walked over.

#### YOUR ADVANTAGES:

- Short payback time
- Low maintenance costs
- Energy saving and optimization in all operating phases



#### EFFICIENT HYDRAULIC FORMING (EHF)

With Efficient Hydraulic Forming, Schuler is significantly minimizing the energy requirement of hydraulic presses. The effect is comprehensive – it happens automatically without intervention by the operator, it occurs in all processes, it works in any operating mode and in all performance categories! This enables you to efficiently reduce your energy bill – and achieve up to 60% energy savings every year.

- Automatic, no operator intervention
- Can be applied on a modular basis





Tryout center with hydraulic tryout presses.



Tryout presses offer maximum flexibility.

## OVERVIEW HYDRAULIC TRYOUT PRESSES

Model	Basic	Basic	Basic	Speed	Basic	Speed
Press capacity [kN]	12,500	16,000		20,000		25,000
Bolster size [mm]	4,600 × 2,500	5,000 × 2,500		5,000 × 2,500		5,000 × 2,500
Slide stroke [mm]	1,700	1,700		1,700		1,700
Die space [mm]	2,300	2,300		2,300		2,300
<b>Bed cushion</b>						
Size* [mm]	3,900 × 1,800	4,200 × 2,100		4,200 × 2,100		4,200 × 2,100
Force [kN]	3,500	4,000		6,000		6,000
Stroke [mm]	300	300		380		380
<b>Slide cushion (optional)</b>						
Size* [mm]	3,600 × 1,500	3,900 × 1,800		4,200 × 2,100		4,200 × 2,100
Force [kN]	2,000	2,000		3,000		3,000
Stroke [mm]	200	200		200		200
<b>Speeds</b>						
V <sub>max</sub> [mm/s]	~50	~44		~70	~330	~58
V <sub>at F<sub>max</sub></sub> [mm/s]	~25	~20		~30	~45	~25
<b>Parallelism control</b>						
	-	-		Optional	Yes	Optional
						Yes

Other sizes upon request.

\* Center distance of the outer pressure pin rows.

## STANDARD EQUIPMENT HYDRAULIC TRYOUT PRESSES

### Mechanical equipment

Single-action press
Computer-calculated press frame in steel welded design, stress-free annealed
Press slide in welded design, stress-free annealed
8-way slide guiding via bronze plates on hardened guide rails
Maintenance-free solid lubricant
Slide parallelism monitoring
Hydraulic bed cushion with one pressure axis
Bed cushion functions: displacer, pad, ejector
Bed cushion-pressure pad with 8-way guiding
Support strips for foundation covering at the press bed (covering provided by customer)
Walkways for crown and oil tanks
One moving bolster to the front
Energy supply to the moving bolster on cable loop on floor level, open duct
Infinitely variable slide locking
Press and safety equipment in compliance with Schuler Standard and EN/DIN
Press erection: without anti-vibration elements on poured mortar
Lighting of the die space

### Service

Operating instructions & operating elements in the language of the respective country
Operator instructions are included

### Hydraulic equipment

"Basic" version slide drive
Force-controlled axial piston pump with superimposed feed quantity as main drive
All units on press crown
Modular design as hydraulic manifold
Nitrogen spring unit control (Nitrodyne control)
Counterflow oil-water heat exchanger, thermostatically controlled, mounted on crown
Nitrogen spring unit control (Nitrodyne control)
Oil filtration in separate cycle
Connections for die auxiliary functions: 1 × air ½" / 1 × receptacle combination 230/400 V
Leak oil drainage in separate tank with level switch

### Electrical equipment, control equipment

Schuler Control System for control and regulation as per IEC 61131-3, PC control
LCD color touchscreen (19")
Ethernet for network interface
EtherCat as bus system for quick axial control
Profinet bus system
Storage for 1,000 die data sets
Die space protection via contact-free safety system (back and front)
Schuler Safety Control System for safety functions
Operating modes: Setup, single stroke
Suspended operator's panel with built-in touchscreen and hardware pushbuttons
Control cabinet-press connecting cable up to 10 m outside of press
Press according to safety category 4, for manual operation, including two-hand control stands and 4 socket-outlets
Control cabinet with AC

## OPTIONAL EQUIPMENT HYDRAULIC TRYOUT PRESSES

**Mechanical equipment**

Hydraulic slide cushion

Caps for pin hole bores

Multi-point control for the bed cushion (4-/6- or 8-point control)

Bed cushion with "pre-acceleration" function

Press bed cover for protection of the bed cushion

Mechanical die spotting stroke limitation

Mechanically adjustable stroke limitation with impact shock dampening

Parallelism control of the slide

Die clamps at slide

Mechanical moving bolster locking

Enlarged daylight in the side uprights

Press erection with spring vibration dampening elements

**Service**

Training for operators and maintenance personnel

Start-up assistance

**Hydraulic equipment**

"Speed" version slide drive

Multicurve-accumulator drive for simulation of mechanical presses

Die spotting control

Die automation: controlled hydraulic connections

Oil and nitrogen filling

**Electrical equipment, control equipment**

Remote diagnostics

**Energy efficiency**

Energy efficiency modules 1 &amp; 2

## SCHULER SERVICE.

# STATE-OF-THE-ART SERVICE FOR MORE PERFORMANCE.

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

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Over 800 service employees worldwide provide expert support 24/7 in close cooperation with you – our partners. Our main priority is always to ensure the maximum productivity and safety of your production equipment in order to secure your company's continued success.

With over 180 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.



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Schuler offers customized cutting-edge technology in all areas of forming – from the networked press to press shop planning. In addition to presses, our products include automation, dies, process know-how and service for the entire metalworking industry. Schuler’s Digital Suite brings together solutions for networking forming technology and is continuously being developed to further improve line productivity and availability. Our customers include automotive manufacturers and suppliers, as well as companies in the forging, household appliance and electrical industries. Presses from the Schuler Group mint coins for more than 180 countries. Founded in 1839 at our headquarters in Göppingen, Germany, Schuler has approx. 5,000 employees at production sites in Europe, China and the Americas, as well as service companies in more than 40 countries. The company is part of the international technology group ANDRITZ.

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