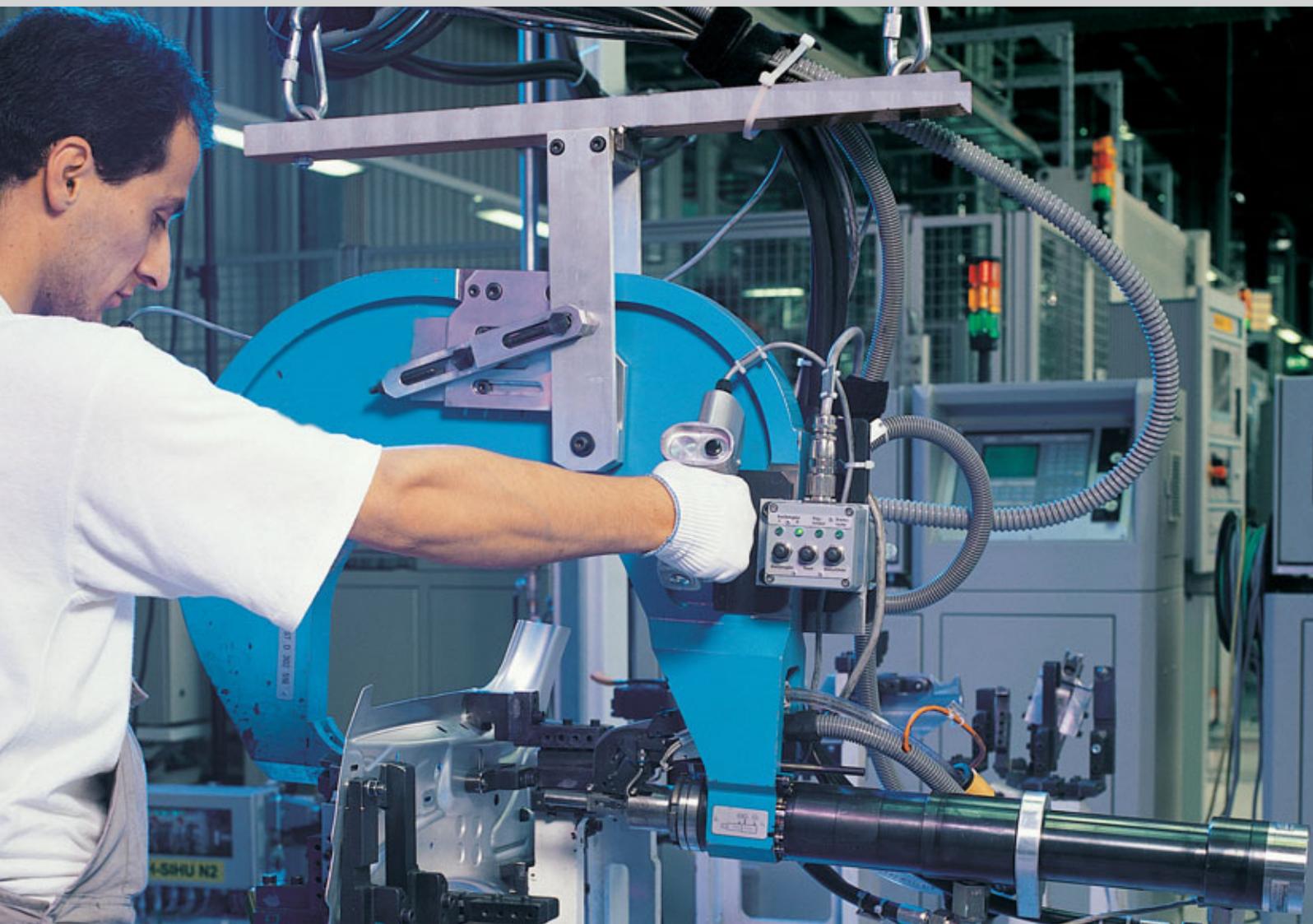


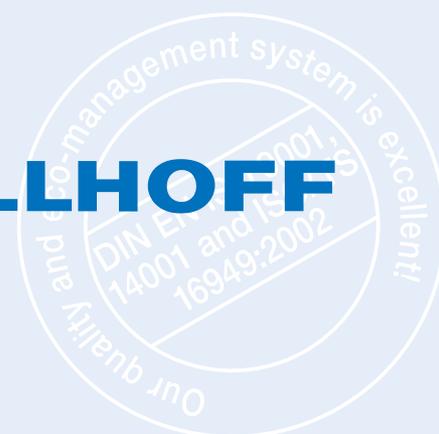
# Self-Pierce Riveting System for Manual Processing HTF / CTF / EBF

## RIVSET®



Self-Pierce Riveting

# BÖLLHOFF



## Contents

|                    | Page  |
|--------------------|-------|
| <b>The Concept</b> | 3     |
| Advantages         | 3     |
| <hr/>              |       |
| <b>HTF</b>         |       |
| The System         | 4     |
| Applications       | 4     |
| Characteristics    | 4     |
| System description | 5     |
| <hr/>              |       |
| <b>CTF</b>         |       |
| The System         | 6     |
| Applications       | 6     |
| Characteristics    | 6     |
| System description | 7-8   |
| <hr/>              |       |
| <b>EBF</b>         |       |
| The System         | 9     |
| Applications       | 9     |
| Characteristics    | 9     |
| System description | 10-11 |



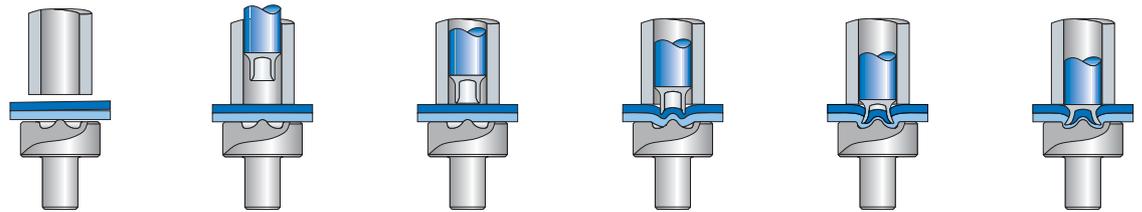
## The Concept

All manufacturing industry has to join materials together. The importance and use of mechanical joining methods has increased significantly in recent years.

The need to accommodate changes in environmental legislation has led to the use of new design concepts and materials. Development programmes have improved mechanical joining into a highly cost effective method of construction and assembly.

The trend is towards the use of lightweight assemblies, galvanised and coated steels, high strength steels, aluminium and plastics and combinations of these materials. As an example, in the Sheet Metalworking Industry the use of the Self Pierce Rivet mechanical joining technique is found to be a cost effective alternative to conventional joining processes.

Self Pierce riveting is a process for the high strength mechanical joining of similar or combinations of materials whereby several layers can be joined without problem.



## The Advantages of Self-Pierce Riveting at a Glance

### The joint

- High strength
- Visual checks possible
- Reproducible
- No pre-drilling
- Impervious to liquids and gas
- For various metal and non-metallic materials
- For various material thickness
- For various material strengths

### The system

- Safe, always correctly located supply
- Rapid automatic processing
- Simple, comfortable, operator friendly operation
- Automated process monitoring possible (as an option)



- Commercial
- Process reliable

- Flexible
- Environmentally safe

## Advantages as compared with more traditional joining methods e.g. spot welding and blind riveting:

### Material mix

- Many material combination options are possible (type of material and thickness)
- Coated metallic materials can be joined (using metallic, organic or inorganic coatings)
- Interim layers e.g. plastic or adhesive, are process-compatible

### Environmental sustainability

- No harmful fumes or gases produced during production process
- Low noise
- Low energy consumption
- No waste (e.g. spatter)

### Process reliability

- Controllable process
- Joint can be checked without damage, (NDT)
- No thermal load on joining zone
- Simple to operate
- No pre/post-treatment required e.g. no pre-cleaning or subsequent removal of spray deposits from the area around the joint
- Does not damage or overheat alloy materials

### Functionality

- The process is ideal for automation and integration into other production operations (e.g. assembly processes)
- Rivet elements can assume other functions depending on design
- Short set-up times

## The RIVSET® HTF Self-Pierce Riveting System

### The System

Self-pierce riveting system for processing RIVSET® self-pierce rivets stored on a tape, designed for manual use, with a battery power supply.



### Applications

- Building sites
- Prototype construction
- Production line rework
- Repairs



### Characteristics

- Processes RIVSET® self-pierce rivets
- Rivet feed and a small setting head to give optimum accessibility to the point of joining
- Battery operated, which can also be replaced with a mains power adapter
- Simple and rapid replacement of parts
- Easy to use
- Adjustable riveting force

## The RIVSET® HTF Self-Pierce Riveting System

### **System Description**

RIVSET® HTF is a battery powered tool for setting self-pierce rivets stored on tape. It is suitable for use with 3 mm shank diameter rivets.

The RIVSET® HTF is a universal small hand tool, with a joining force of up to 35 kN, which opens up a wide range of possible applications.

### **Functions**

The materials to be joined are placed between the punch and die. By continually pressing the trigger, the punch, complete with the rivet feed system moves rapidly towards the workpiece. As it approaches the top surface, the internal pump switches to a slower setting stroke. Removing your finger from the trigger stops this forward motion.

The RIVSET® HTF is fitted with a microprocessor, which controls and monitors its various functions. It automatically switches the motor off after the preset joining force has been reached thus completing the riveting cycle.

As a design feature the punch can be returned to the starting position at any time, by operating the return trigger. After the joining process is completed the punch assembly automatically returns to the starting position, and another rivet can now be set.

The "C"-frame and riveting head can be rotated through 360° about its longitudinal axis.

### **Equipment**

The machine consists of the components shown in the photograph, including the battery charger unit and is delivered ready for use. A riveting and service test is carried out in our factory before delivery and the results and settings are documented.



## The RIVSET® CTF Self-Pierce Riveting System

### *The System*

Self-pierce riveting system for processing RIVSET® self-pierce rivets stored on tape for manual operation in general industry, especially medium volume production.



### *Applications*

- Manual operation
- Either the component or the tool can be manipulated

### *Characteristics*

- Processing of RIVSET® self-pierce rivets stored on tape for industrial applications with high degree of flexibility in the choice of rivet types
- Rivet feed and setting head with small overall size for optimum accessibility to the point of joining
- Robust mechanical design for long service life of the components under load in the setting head
- Simple and rapid replacement of wear parts (Example: punch has a bayonet fitting)
- Easy to use
- Short riveting cycle times
- Small space requirement
- Adjustable riveting force

## The RIVSET® CTF Self-Pierce Riveting System

### System Description

RIVSET® CTF is a system for setting self-pierce rivets stored on tape with the capability to rapidly change between different rivet types. All the mechanical parts needed to feed the rivets are fitted directly in the setting head itself creating advantages for both tool life and wear. This system achieves “careful” movement of all rivet types, including even the smallest dimensions, such as 3 x 4 mm, without damage. The simple construction of the RIVSET® CTF provides maximum reliability, ease of maintenance and servicing.

### Setting Tool

A small lightweight setting tool complete with a mechanical rivet feed is fitted with a double-acting hydraulic cylinder for both the setting and return strokes, giving rapid cycle times. Although standard “C”-frames are available they can also be designed to meet the particular accessibility requirements of the workpiece.



### Setting Head

The action of the punch during the setting cycle causes a star wheel to advance the tape by one rivet. As this movement is done by means of slots in the tape the rivet itself is not subject to any mechanical force and therefore even the smallest rivets, (3 by 4 mm long), can be reliably made ready for the next setting stroke.



### Power Supply

The power supply consists of the hydraulic pump with its associated valves and the control cabinet. All the settings for a successful joint can therefore be made centrally. The unit housing also contains an oil collection pan below the power unit to prevent any spillage reaching the environment.

The maximum distance between the power supply unit and the setting tool is between 6 m and 10 m, the length of the hydraulic hoses.



## The RIVSET® CTF Self-Pierce Riveting System

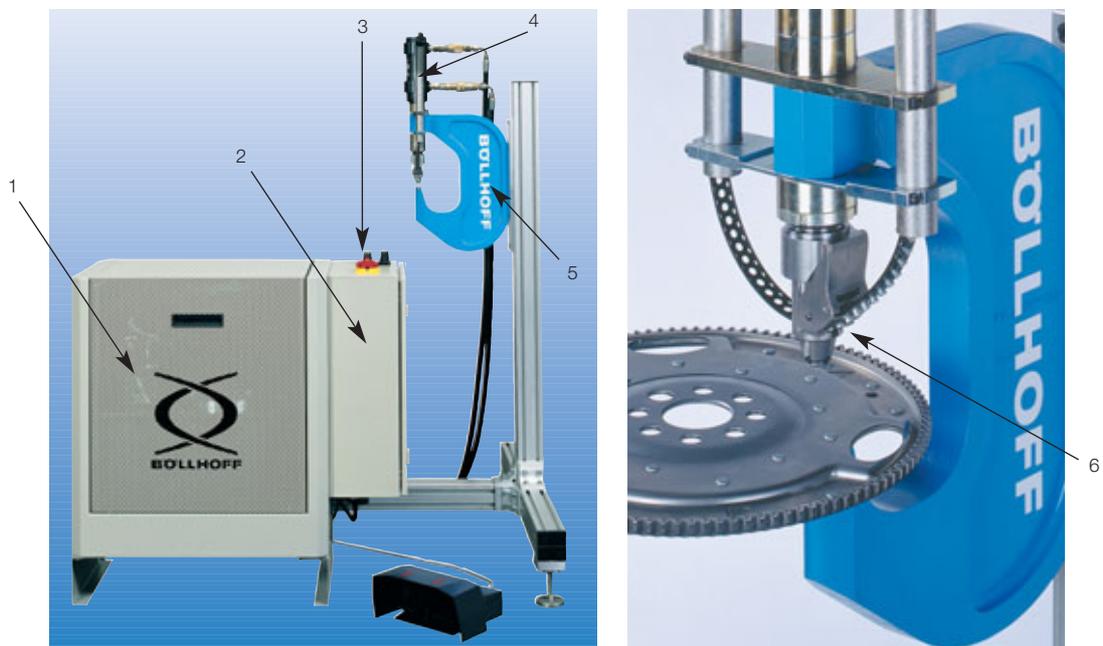
### Functions

The self-pierce riveting is achieved by utilising Böllhoff's innovative design, as shown by the rivet indexing mechanism. This takes place within the **setting head** (6), designed so that the return movement of the punch causes the rivet to be moved ready for immediate setting. The **power unit** (1) controls the movement of the double **acting cylinder** (4) via high pressure hoses.

The rivet setting tool, (hydraulic cylinder, setting head, die etc.) are fastened to the **"C"-frame** (5).

During manual operation the "C"-frame can be held by a gyroscopic suspension system or, if the workpiece is being moved, fastened to a static pedestal.

The **operator controls** (3) are placed on the top of the **control panel** (2), which is located at the side of the **power unit** (1) and is accessed through a door. Dependant upon the application a double acting foot switch can be supplied.



### Equipment

The system consists of the components shown in the photograph and is delivered ready for use. A riveting and service test is carried out in our factory before delivery and the results and settings are documented.

In addition we can offer the option of having installation or commissioning carried out by our customer service technical staff.

## The RIVSET® EBF Self-Pierce Riveting System

### The System

Self-pierce riveting system for processing loose RIVSET® self-pierce rivets, preferably for manual operation in general industry, especially medium volume production.



### Application

- Manual operation
- Both the component or the tool can be manipulated

### Characteristics

- Processing of loose RIVSET® self-pierce rivets as an economical alternative to industrial production
- Even the smallest dimensions for rivet (3 x 4 mm / 3 x 5 mm) are safely supplied
- Low logistics and warehousing costs in comparison with rivets supplied on belts
- Setting head and rivet feed system has a minimum contour for optimum accessibility to the point to be joined
- Robust mechanical design for long service life of the components under load at the setting head
- Simple and rapid replacement of parts (example: punch has a bayonet fitting)
- Highly flexible thin blowfeed hose ensures ease of manipulation
- Short riveting cycle times
- Requires minimum space
- Clear user interface and simple operation at the combined supply/control/hydraulic unit
- Adjustable riveting force

## The RIVSET® EBF Self-Pierce Riveting System

### System Description

The most outstanding feature of the RIVSET® EBF is its compactness. The “turnkey” solution enables it to be rapidly installed and commissioning is simply achieved by connecting it to the factory electrical and pneumatic supplies. The setting tool is fitted with a hold-down function to give an optimised joint by pressing together the materials to be joined. This is achieved because during the joining process, the hold down device ensures that the rivet pulls the least possible surrounding material with it as it sets.

The hold down force can be set separately from the setting head force, enabling the best setting parameters to be selected for different materials.

Production using loose rivets has advantages for the manipulation of the setting tool. The narrow design of the setting head gives the operator a good view of the point to be joined, which enables the tool to be accurately positioned. As there are no other rivet feeder parts, such as a rivet roll holder or supply and removal pipes, the tool can be kept correspondingly smaller and lighter.

### Setting Tool

A small lightweight setting tool with pneumatic supply, (blowfeed), of individual rivets. The hydraulically driven setting cylinder has a hold down function to improve the riveting result.

Although standard “C”-frames are available they can also be designed to meet the particular accessibility requirements of the workpiece.



### Rivet Feed System

A drum type rivet separator is integral within the rivet feed system, mounted within the combined supply unit, and is protected from outside contamination as well as the accidental introduction of foreign and wrong components. The requirement for rapid refilling of this tool is achieved without compromising the careful storage and feeding of the rivets.



### Power Supply Unit

The compact hydraulics equipment complete with its oil collection pan can be removed as an assembly from the combination supply unit for servicing and maintenance. This is also where the hold down pressure and setting pressure can be set for particular materials to be joined.



## The RIVSET® EBF Self-Pierce Riveting System

### Combination Supply Unit

The combination supply unit brings together the rivet feed, hydraulic system and the electronic/electrical controls. All that is necessary is to connect the factory pneumatic and electrical supply for immediate start up. On the front of the unit one finds the operator interface, which allows for additional parameters to be set and outline diagnostic data to be accessed.

The maximum distance from the power supply unit and the setting tool is between 6 m and 10 m, the length of the hydraulic hoses.



### Functions

From the supply hopper of the rivet feed **module** (1) the rivets are transferred to the feed rail by means of a rotating disc driven by an electric motor and then moved into a singulation device.

Here, the rivet falls through a pneumatically driven rotary valve into the blowfeed **hose** (6) and is transported with air support to the transfer unit. A mechanism in the transfer unit slides the rivet into the **setting head** (7) directly below the punch, where it is held centred on its axis by sprung locating jaws. The punch must be in its starting position to ensure this occurs correctly.

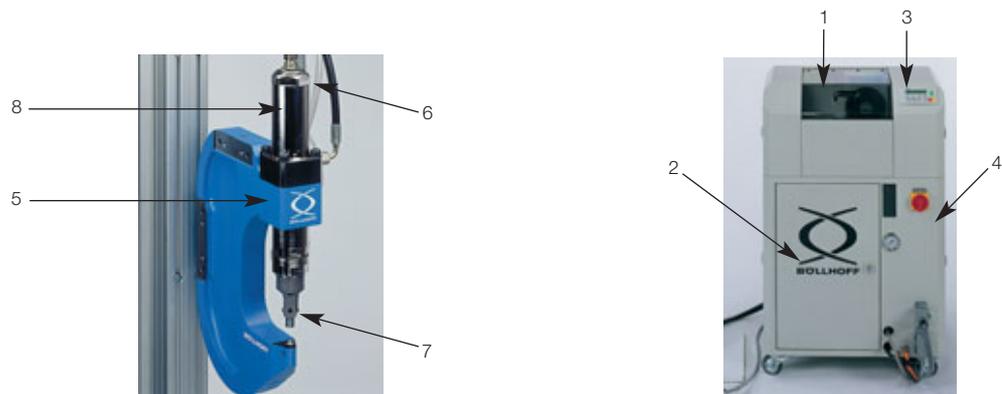
The integral **hydraulic unit** (2) controls the movements of the small **hydraulic cylinder** (8), via the hydraulic hoses.

To ensure safe processing, the rivet is monitored by a number of sensors on its way to the punch.

The rivet setting tool, (hydraulic cylinder, setting head, die etc.) are fastened to the **“C”-frame** (5).

The status of the system and error messages are displayed on the **control panel** (3), together with the operator controls that are needed.

The **control cabinet** (4) is located in the housing next to the hydraulic unit and is accessed through a door.



### Equipment

The system consists of the components shown in the photographs and is delivered ready for use. A riveting and service test is carried out in our factory before delivery and the results and settings are documented. In addition we can offer the option of having installation or commissioning carried out by our customer service technical staff.

# Böllhoff International

## North Europe

Wilhelm Böllhoff GmbH & Co. KG, Bielefeld  
Böllhoff GmbH, Bielefeld with branches  
in Bielefeld, Braunschweig, Burgau, Dormagen,  
Leipzig, Munich, Nuremberg and Stuttgart,  
Böllhoff Verbindungstechnik GmbH, Bielefeld  
Böllhoff Systemtechnik GmbH & Co. KG, Bielefeld,  
Böllhoff Schraubtechnik GmbH, Bielefeld  
Böllhoff Produktion GmbH & Co. KG, Bielefeld and Sonnewalde,  
Germany  
Bollhoff Fastenings Ltd., Birmingham, Great Britain

## South-West Europe

Bollhoff Oталu s. a., La Ravoire,  
Bollhoff Usinec s. a., Paris,  
France  
Bollhoff S.P.R.L., Aalst, Belgium  
Bollhoff s.r.l., Mailand, Italy  
Bollhoff s.a., Madrid, Spain

## South-East Europe

Böllhoff GmbH, Linz, Austria  
Böllhoff Kft, Székesfehérvár, Hungary  
Böllhoff s. r. o., Prag, Czech-Republic  
Böllhoff s.r.l., Bors, Romania  
Bimex-Böllhoff\*, Łańcut and Lipno, Poland  
Böllhoff-000\*, Russia

## North America

Bollhoff RIVNUT® Inc., Kendallville, Indiana, USA  
Bollhoff Inc., Ontario, Canada  
Bollhoff S.A. de C.V., Mexico City, Mexico

## South America

Bollhoff Adm. e Part. Ltda., Jundiaí,  
Bollhoff Service Center Ltda., São Paulo, Porto Alegre and Curitiba  
Arquimedes Participacoes S.A, Jundiaí,  
Bollhoff Neumayer Industrial Ltda.\* , Jundiaí,  
Brazil  
Bollhoff S.A., Buenos Aires, Argentina

## Africa

Bollhoff (Pty) Ltd., Centurion, South Africa

## Asia

Bollhoff Fastening Ltd., Wuxi, China

\*Joint-Ventures

In addition to Böllhoff companies in these 19 countries, the company has a network of agents and dealers serving an international customer base on major industrial markets world-wide.

