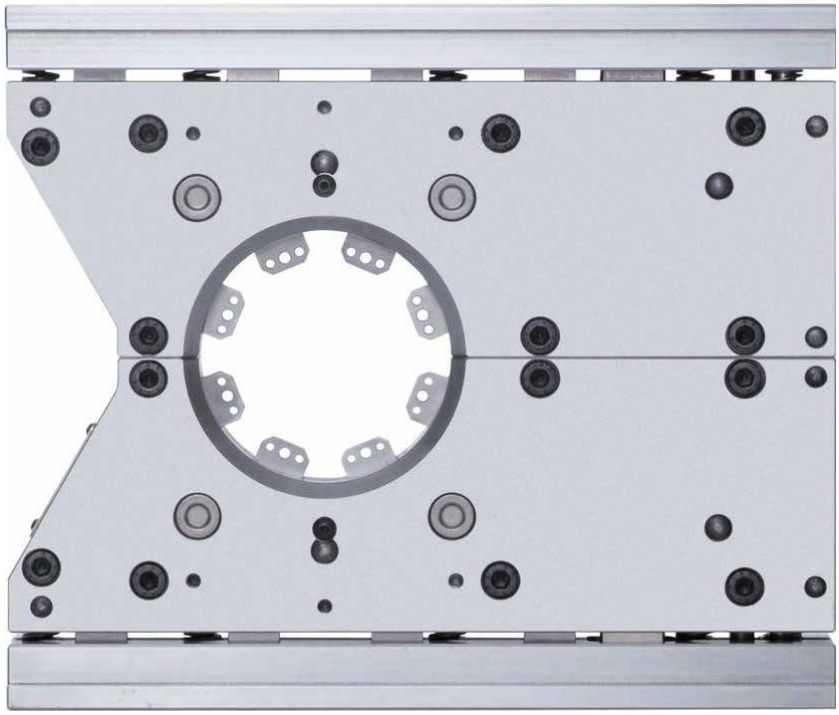


OETIKER COMPACT
OETIKER COMPACT XL

Instruction manual

Original instruction manual
Issue 06.22

Part no. 08901311
Oetiker Switzerland AG, Horgen, Switzerland

Table of contents

1 Information about this manual 1-4
1.1 Symbols and meanings of the representations used 1-4
1.2 Scope 1-4

2 Basic safety instructions 2-5
2.1 How to use the instruction manual 2-5
2.2 Intended use 2-5
2.3 Inadvertently starting of the swaging tool 2-5
2.4 Specific safety instructions 2-6
2.4.1 Moving parts 2-6
2.4.2 Flying parts 2-6
2.4.3 Overturning 2-6
2.4.4 Noise level 2-6
2.5 Safety working methods 2-6
2.6 Modifications and damages 2-6
2.7 Qualified personnel 2-7
2.8 Maintenance tasks 2-7
2.9 Obligations of the operator 2-8
2.10 Signs on the swaging tool 2-8

3 Description 3-9
3.1 Design 3-9
3.2 Function 3-9

4 Installation 4-10
4.1 Unpacking 4-10
4.2 Preparing the installation 4-10
4.3 Installing the swaging tool 4-10
4.4 Installing support elements (option) 4-11

5 Operation 5-12
5.1 Preparing operation 5-12
5.2 Testing function 5-12
5.3 Swaging with the swaging tool 5-13

6 Maintenance 6-14
6.1 Perform maintenance according to the maintenance schedule 6-14
6.2 Cleaning and oiling the swaging tool 6-14
6.3 Checking and changing swaging jaws 6-14
6.4 Checking and changing internal components 6-15
6.4.1 Overview 6-15
6.4.2 Procedure 6-16
6.5 Ordering spare parts 6-17

7 Troubleshooting 7-18

8 Transport, storage and disposal 8-19
8.1 Transport 8-19
8.2 Storage 8-19
8.3 Disposal 8-19

9 Appendix 9-20
9.1 Technical Data 9-20
9.1.1 General technical data 9-20
9.1.2 Lubricant 9-20
9.2 Minimal requirements for press 9-21
9.3 Spare parts 9-22
9.4 Statement of conformity (template) 9-23

10 Help and Support 10-24

1 Information about this manual

1.1 Symbols and meanings of the representations used

Various warning signs are used in this instruction manual to alert the reader about potential damage to property and personal injury.

- ▶ Compliance with these warning signs is mandatory.
- ▶ Compliance with the instructions that are flagged with a warning sign and text is mandatory.

The following symbols are used in this instruction manual:

⚠ WARNING
Dangerous situation. Non-compliance with these instructions may lead to fatal or serious injuries.

Symbol	Meaning
▶ ...	Single-step call to action
1. ... 2. ... 3. ...	Multi-step call to action ▶ Note the sequence.
✓ ...	Requirement • Necessary or labor-saving steps for the successful execution of an action.

1.2 Scope

This instruction manual applies to the following tools:

- OETIKER COMPACT swaging tool (Article number: 13400538)
- OETIKER COMPACT XL swaging tool (Article number: 13401306)

This instruction manual describes the function as well as the correct Installation, operation, storage and transport.

This instruction manual contains important information for safe working procedures.

2 Basic safety instructions

2.1 How to use the instruction manual

- ▶ Make sure that this instruction manual is always available for use within easy reach.
- ▶ If the swaging tool is sold, ensure this instruction manual is passed on to the next owner of the swaging tool.
- ▶ Please read the instruction manual carefully before commissioning the swaging tool
  - – Familiarize yourself with all settings and their functions.
  - – Anyone setting up, commissioning, maintaining or repairing the swaging tool must have read and understood the instruction manual and in particular the safety instructions.

2.2 Intended use

- The OETIKER COMPACT and COMPACT XL is a swaging tool and used for swaging (cimping) OETIKER Multi Crimp Rings (MCR).
- The swaging tool is only to be installed and operated in a press that meets the correct requirements *(see chapter 9.2).* Operation of the swaging tool is prohibited until the press (external driving mechanism) complies with the provisions of the Machinery Directive 2006/42/EC.
- The swaging tool is to be used in a conventional location set aside for machines (industrial operation).
- Uses extending beyond those specified are not permitted.
- The manufacturer or vendor is not liable for any associated damages or injuries if the swaging tool is used for applications other than those specifically designated herein. The user alone is responsible for the consequences.
- The swaging tool is built in accordance with the currently valid state of technology as well as the safety-related rules currently in effect.

2.3 Inadvertently starting of the swaging tool

The swaging tool is installed and operated in a press provided by the operater. If the press is started inadventetly, a press sequence is triggered. There is a risk of serious injury.

- ▶ Ensure that the press cannot be started up inadvertently before installing, deinstalling or while working on the swaging tool.
- ▶ Observe the safety instructions of the press.

2.4 Specific safety instructions

2.4.1 Moving parts

During operation, there is a risk of serious injury from crushing, cutting and shearing of fingers and hands between the upper and lower halves of the swaging tool and in the area of the swaging jaws.

- Do not reach between the upper and lower halves and in the area of the swaging jaws during operation.
- Before carrying out installation, deinstallation and maintenance work on the swaging tool, ensure that the press cannot inadvertently be activated.

2.4.2 Flying parts

If the Multi Crimp Rings break during operation, parts can be ejected at high speed. There is a risk of serious eye injury.

- Wear safety goggles when working with the swaging tool.

2.4.3 Overturning

If the swaging tool is not fixed correctly, there is a risk of serious injuries owing to overturning.

- When using the swaging tool, fix it correctly in the clamping elements provided for this purpose.
- Store and transport the swaging tool secured against overturning.
- Wear protective shoes and gloves.

2.4.4 Noise level

During operation, there is a risk of hearing damage because of high noise level.

- Wear ear protection when working with the swaging tool.

2.5 Safety working methods

- Use protective equipment that is appropriate for the respective assignment: safety goggles, ear protection and safety shoes.
- Do not operate the swaging tool in areas where acids or similar chemicals are stored.

2.6 Modifications and damages

- Do not modify the swaging tool without the consent of OETIKER. Any modification excludes liability on the part of OETIKER for any resulting damage or injuries.
- Only use original spare parts and accessories.
- Do not operate the swaging tool, if it has visible damage (e.g., to the swaging jaws). The tool is to be taken out of service immediately.

2.7 Qualified personnel

The use of this swaging tool is reserved exclusively for authorized and qualified personnel. Use without reading the instruction manual is prohibited. The authorization levels for use are as follows:

Personnel / Activities	Operator	Maintenance and repair personnel
Operating the swaging tool	✓	✓
Installing, deinstalling and cleaning the swaging tool	✓	✓
Maintaining and repairing the swaging tool	×	✓

Explanation: ✓ = permitted × = not permitted

„Operator“

- is familiar with the specified safety instructions and regulations
- knows the relevant procedures described in this document
- has been trained appropriately
- has been trained in the use with the swaging tool (press = has been trained by the operator)

The operating company must ensure that the employee has received the safety instructions and regulations in his or her respective language.

„Maintenance and repair personnel”

- possesses the knowledge described for the „operator”
- has received technical training and is experienced in the use of appropriate tools for maintenance and repair of the swaging tool

2.8 Maintenance tasks

The maintenance intervals specified in the instruction manual must be observed. Maintenance and repair instructions must be observed accordingly *(see chapter 6).*

- ▶ Only qualified maintenance and repair personnel shall be permitted to proceed with maintenance and repair tasks
- ▶ Do not immerse the swaging tool in water or other fluids.

2.9 Obligations of the operator

- Observe and comply with the generally applicable, legal and other binding regulations for accident prevention as well as the generally acknowledged safety-related and industrial health regulations.
- Observe and comply with the environmental regulations applicable within the country where the swaging tool is being used.

2.10 Signs on the swaging tool

The nameplate (1) is located on the sloping face of the swaging tool.

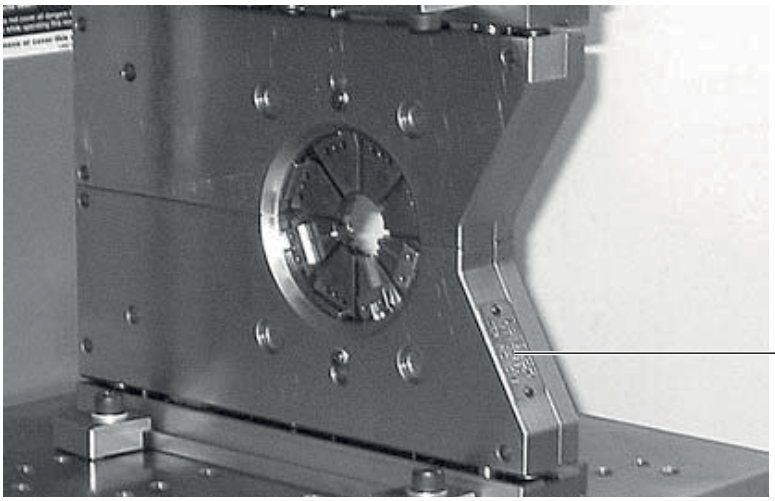


Fig. 1 Nameplate

The nameplate contains the following informations:

- Product name/manufacturer
- Article no.
- Serial no.

3 Description

3.1 Design

The following figure shows the typical installation situation of the swaging tool in a hydraulic press.

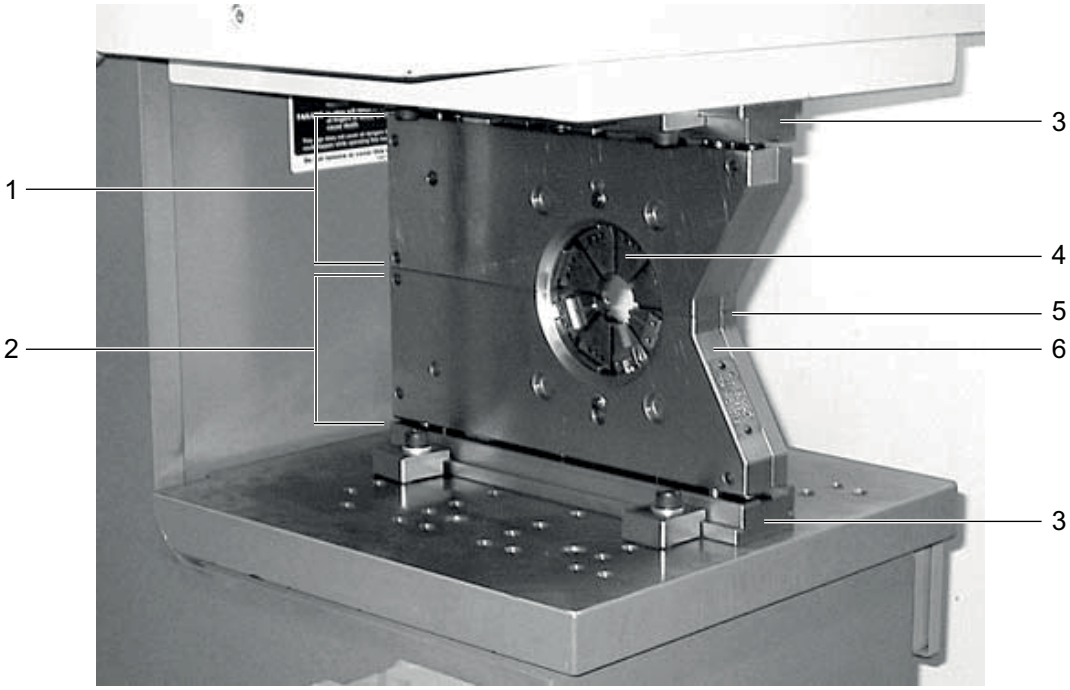


Fig. 2 Design

1	Upper half of tool	4	Swaging jaws
2	Lower half of tool	5	Cover plate
3	Pressure plate	6	Guide plate

3.2 Function

The swaging tool is used to swage (press or crimp) Multi Crimp Rings. It is operated by an external driving mechanism, e.g., an hydraulic press. The swaging tool can be lifted, thus allowing radial workpiece placement. Eight exchangeable swaging jaws (closure segments) allow MCR diameter adjustments with minimal handling.
Workpieces as well as the associated MCR are manually inserted into the swaging tool.

- The compact version COMPACT swages rings with diameter 16...60 mm.
- The large version COMPACT XL swages crimp rings with diameter 16...109 mm.

4 Installation

⚠ WARNING

Serious injuries due to starting press!

▶ Ensure that the press cannot be started up inadvertently before installing the swaging tool.

4.1 Unpacking

1. Remove packaging materials completely. Save the wooden box for later storage and transport *(see chapter 8).*
2. Check components for completeness, correctness and damage. Replace damaged components with original-spare parts. If parts are missing, contact OETIKER customer service *(see chapter 10).*

4.2 Preparing the installation

1. Ensure that the installation site meets the following conditions:
   – Sufficient space for the installation/deinstallation as well as for the operator's work area
   – No acids or similar chemicals are stored
2. Ensure that the press meets the correct requirements *(see chapter 9.2)*.

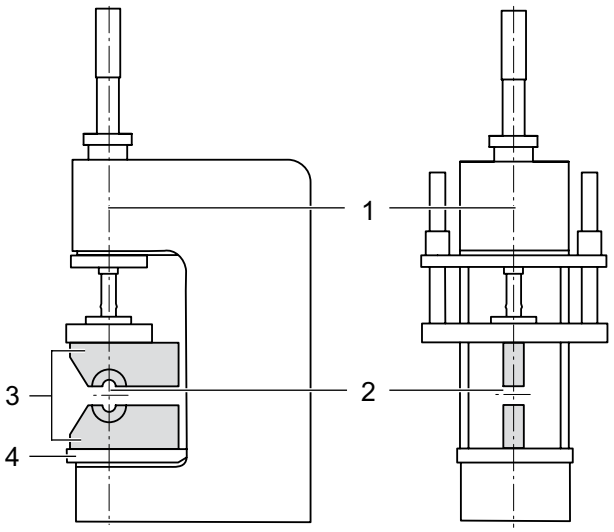
4.3 Installing the swaging tool

⚠ WARNING

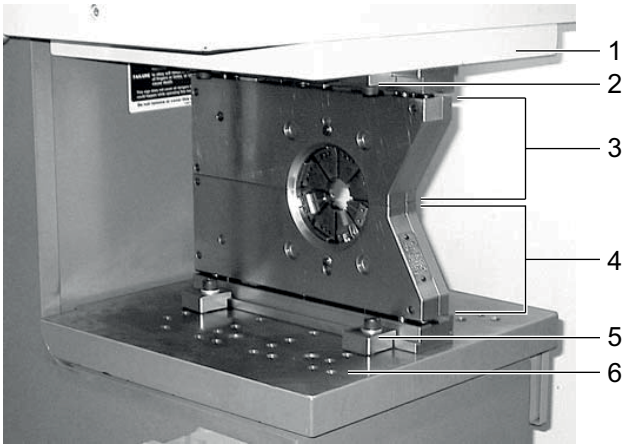
Serious injuries due to overturning of the swaging tool!

▶ Ensure that the swaging tool is always fixed in place.

1. Position the swaging tool (3) at the desired position on the tool table of the press (4).
2. Align the swaging tool. The axis of the pressure ram (1) and pressure area center (2) must be perfectly aligned with each another.



3. Secure the lower half of the swaging tool (4) to the tool table (6) using the four clamping elements (5).
4. Align the upper and lower halves of the swaging tool (3, 4).
5. Carefully lower the press onto the upper half of the swaging tool (3).
6. Fasten the upper half of the swaging tool (3) to the press plate (1) using the four clamping elements (2).



4.4 Installing support elements (option)

The guide and cover plates each have three M6 threads for attaching optional workpiece rests or guidance elements.

▶ If required, install support elements to the swaging tool.

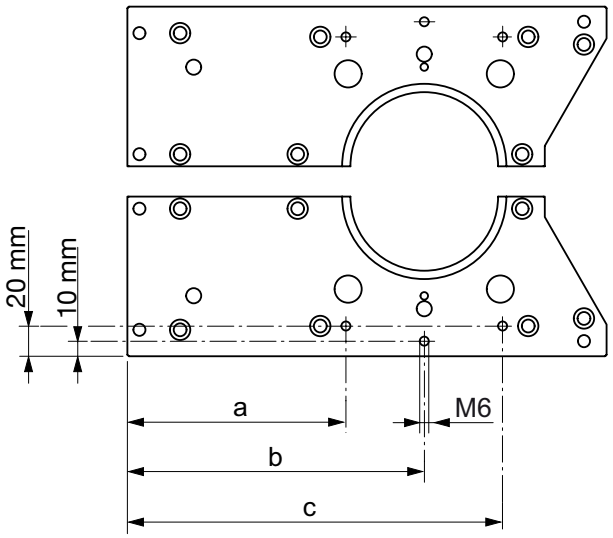


Fig. 3 Dimensions of the M6 threads

Distance	Value [mm]	
	COMPACT	COMPACT XL
a	145	166
b	195	235
c	245	304

5 Operation

⚠ WARNING

Crushing of fingers and hands while the swaging tool is pressing!

- Do not touch or reach into the swaging jaws and the upper and lower halves of the swaging tool while pressing.

⚠ WARNING

Serious eye injuries due to ejected metal splinters from breaking MCR!

- Wear safety goggles when working with the swaging tool.

⚠ WARNING

Hearing damage due to high noise level!

- Wear ear protection when working with the swaging tool.

5.1 Preparing operation

✓ Swaging tool installed correctly.

- Ensure that the following prerequisites are fulfilled:
  - Swaging jaws relevant to the workpiece are installed.
  - Positioning equipment, if required, is to be put in place.
  - The external diameter of the MCR to be swaged is known.
  - The press stroke and pressing time is known.

5.2 Testing function

Before commissioning the swaging tool, a function test is mandatory. When setting up a new application (workpiece or MCR), a function test is optional.

✓ Operation prepared.

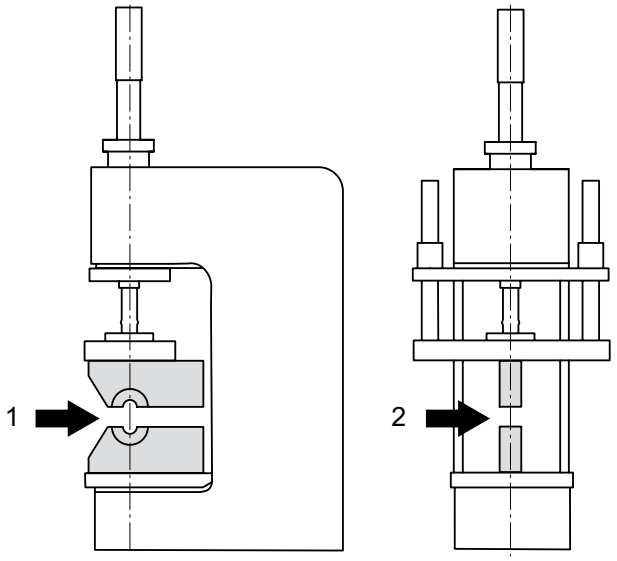
1. Check to ensure that the swaging jaws selected are suitable for the MCR being used (The engraved size [ø in mm] on the swaging jaws indicates the smallest obtainable diameter of the MCR to be swaged.).
2. Open the press.
3. Insert the workpiece and relevant MCR.

4. Start the press sequence:
   – Place the press in set-up mode.
   – Close the swaging tool only until the desired ring diameter is reached.
5. Check the press result:
   – Measure the external diameter of the pressed MCR. The diameter must agree with the prescribed press parameters.
   – Increasing or decreasing the press stroke changes the ring diameter accordingly, until minimal swaging force is reached. In this case upper and lower halves are touching the pressure plate.

5.3 Swaging with the swaging tool

✓ Operation prepared.
✓ Function tested, if required.

1. Place the press in its starting state. Move the upper part of the press to its upper position.
2. Feed the workpiece radially (1) or axially (2). Ensure the MCR lies exactly within the swaging jaws (between the side edges).
3. Start the press sequence.
   (The side edges of the swaging jaws prevent slipping of the MCR during the press sequence.)
4. Remove the workpiece radially (1) or axially (2) as soon as the upper part of the press is again in its starting position.



6 Maintenance

⚠ WARNING

Serious injuries due to starting press!

▶ Ensure that the press cannot be started up inadvertently before working on the installed swaging tool.

6.1 Perform maintenance according to the maintenance schedule

▶ Maintain the swaging tool as specified in the maintenance schedule:

When?	What?
Daily	▶ Clean the swaging tool with a dry cloth on all accessible locations, if it is heavily soiled.
Weekly	▶ Clean and oil the swaging tool *(see chapter 6.2).*
	▶ Check and change the swaging jaws, if worn *(see chapter 6.3)*
After 250,000 strokes	▶ Check, lubricate and change the compontents with a high degree of wear and tear, if worn *(see chapter 6.4)*.
Every year or after 1,000,000 strokes (depending on which occurs first)	▶ Check, lubricate and change the compontents with a low degree of wear and tear, if worn *(see chapter 6.4)*.

6.2 Cleaning and oiling the swaging tool

OETIKER recommends oiling the surfaces to prevent corrosion.

1. Clean the swaging tool with a dry cloth or a petroleum cloth.
2. Oil the surfaces of the swaging tool with the applicable oil *(see chapter 9.1.2)*.

6.3 Checking and changing swaging jaws

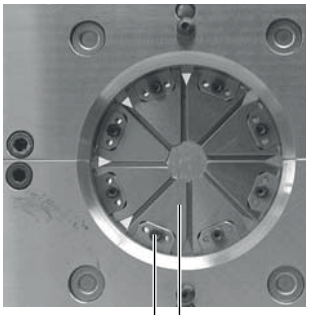
The check and change can be carried out either with swaging tool installed or deinstalled. It can also be carried out with the swaging tool closed (A) or open (B). All swaging jaws are engraved with a size (ø in mm). This size indicates the smallest obtainable diameter of the MCR to be swaged.

The wear of the swaging jaws is strongly dependent on the usage, i.e. the number of cycles per year, the application, the required crimp force and the MCR type used *(see chapter 6.4.1)*. Typical signs of wear and damage are the following:

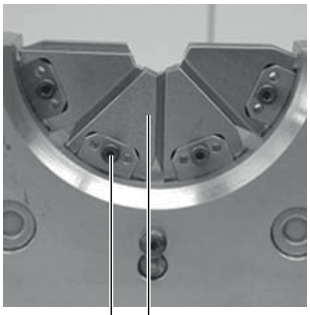
- Edge fractures on the jaws
- Erosion of the material is present (> 0.05 mm)
- Cams and sliders cannot reduce the diameter anymore

1. Check the swaging jaws. In case of wear and damage, replace the parts as described below.
2. Unscrew screws (1).
3. Remove swaging jaws (2).
4. Install the new swaging jaws. If necessary, in the receptacle lightly strike the swaging jaws with a rubber hammer.
5. Tighten screws with the correct torque value:
   – Compact = 3 Nm
   – Compact XL = 5.5 Nm

A



B



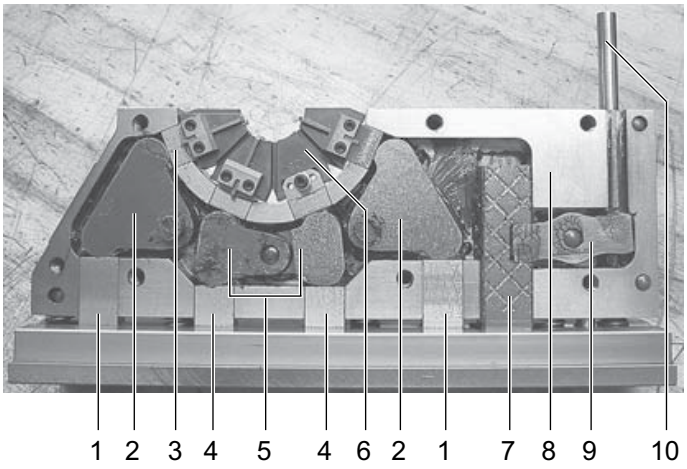
6.4 Checking and changing internal components

6.4.1 Overview

The components are classified according to their degree of wear and tear:

Degree of wear and tear	Component	Typical signs of wear and damage
High	Swaging jaws, large and small cams, slider	• Visible wear (> 0.05 mm) • Edge fractures or flakes • Corrosion of the material
Low	Large and small push block, latch, push rod, guide, plate, lever	

The figure shows the internal components of the swaging tools upper and lower half equally. The cams (2, 5) are positioned on roller bearings. The roller bearings are permanently lubricated and require no maintenance.



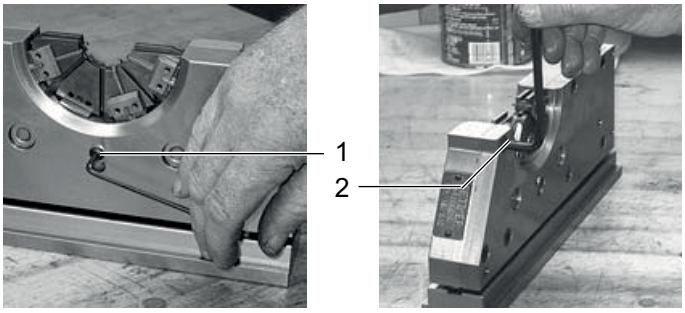
1	Large push block
2	Large cam
3	Slider
4	Small push block
5	Small cam
6	Swaging jaws
7	Latch
8	Guide plate
9	Lever
10	Push rod

Fig. 4 Overview of the internal components

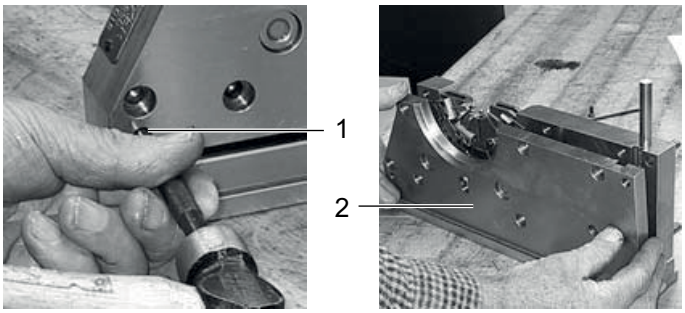
6.4.2 Procedure

To check the internal components, the swaging tool must be disassembled.

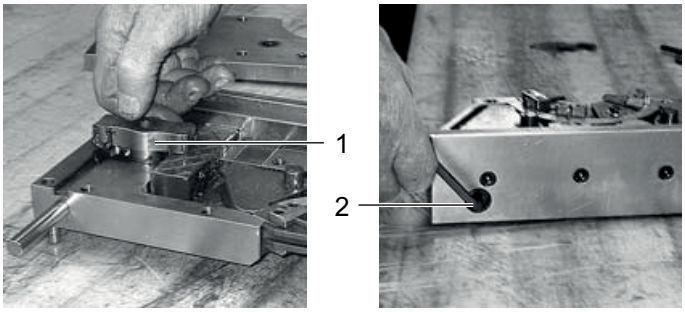
1. Separate the swaging tool.
2. Unscrew screw M5 x 8 mm (1).
3. Unscrew 7 screws M8 x 20 mm (2).



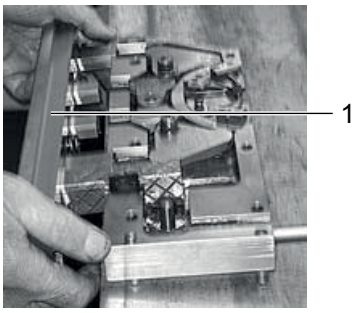
4. Strike back but do not remove 5 dowel pins (1).
5. Remove cover plate (2)



6. Place mechanism off to the side on the dowel pins.
7. Dismount lever (1).
8. Unscrew 2 pass screws (2) from the pressure plate.



9. Take out pressure plate (1) from below.
10. Check all components and roller bearings for typical signs of wear and damage *(observe chapter 6.4.1)*. Replace components, if necessary *(observe chapter 6.5).*
11. Clean and remove soiled old grease.
12. Lubricte all components with the applicable grease *(see chapter 9.1.2).*
13. Assemble the swaging tool in reverse order. Tighten srews with the correct torque value:
    - M5 = 5.5 Nm
    - M8 = 23 Nm



6.5 Ordering spare parts

1. Provide the following particulars:
   - Product identifier, article number, serial number of the swaging tool (see chapter 2.10).
   - Quantity and name of the spare part, spare part number (see chapter 9.3).
   - Shipping information (truck or train) and exact delivery address.
2. Contact the OETIKER customer service for ordering spare parts *(see chapter 10).*

7 Troubleshooting

⚠ WARNING

Serious injuries due to starting press!

▶ Ensure that the press cannot be started up inadvertently before working on the installed swaging tool.

Malfunction	Possible cause	Troubleshooting measures
Diameter of the pressed ring is incorrect.	Swaging jaws are worn	▶ Change swaging jaws *(see chapter 6.3).*
	Defective internal component	▶ Replace internal components *(see chapter 6.4).*
	Incorrect press stroke	▶ Set stroke correctly.
	Incorrect press pressure	▶ Adjust press pressure.
	Inexact clamping of the swaging mechanism (misaligned)	▶ Check clamping *(see chapter 4.3).*
	Swaging jaws are not properly construed.	▶ Contact Customer Service.
Swaging jaws remain hung up. Not in starting position when opened.	Excessive dirt accumulation	▶ Clean swaging tool.
	Improper grease was used to lubricate the internal components.	▶ Use only applicable grease *(see chapter 9.1.2).*
	Pressure spring is worn	▶ Replace compression spring in jaw supports *(see chapter 6.4).*

For all other issues please contact your local OETIKER Service Center.

8 Transport, storage and disposal

The swaging tool (2) is delivered in a wooden box (1).
The wooden box is also used for transport and storage.
Before transporting and storing please oil the swaging tool *(see chapter 9.1.2)*

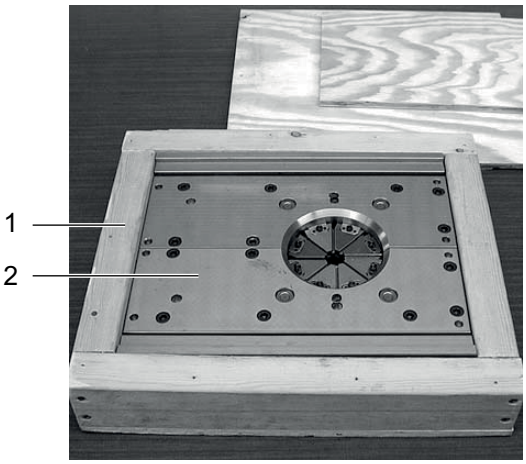


Fig. 5 Transporting and storaging the swaging tool

8.1 Transport

▶ Transport the swaging tool in the wooden box.

8.2 Storage

1. Ensure the following conditions at the storage place:
   – dust free
   – clean
   – dry
   – correct room temperature
2. Pack the swaging tool in the wooden box. Ensure that the tool is secured against damage and sudden changes in position.

8.3 Disposal

▶ Dispose the swaging tool in accordance with your national regulations. OETIKER recommends that you contact a specialized disposal company for this purpose.

9 Appendix

9.1 Technical Data

9.1.1 General technical data

Parameter		Value	
		COMPACT	COMPACT XL
Dimension	Length	316 mm	385 mm
	Width	58 mm	58 mm
	Height	268 mm	330 mm
Weight		22 kg	32 kg
Press data	Ring dimension	ø 16 to 60 mm	ø 16 to 109 mm
	Ring widths	7, 8, 9 and 10 mm	
	Swaging jaws stroke	ø 8 mm	
Material		Steel	
Applicable crimp rings		OETIKER Multi Crimp Ring (MCR, PG 150, PG 250)	

9.1.2 Lubricant

Type	Purpose	Specification
Grease	Lubricating internal components	CASTROL MOLY GREASE (Equivalent greases from other manufacturers are also permissible)
Oil	Oiling swaging tool	Commercially available oil for mechanical parts

9.2 Minimal requirements for press

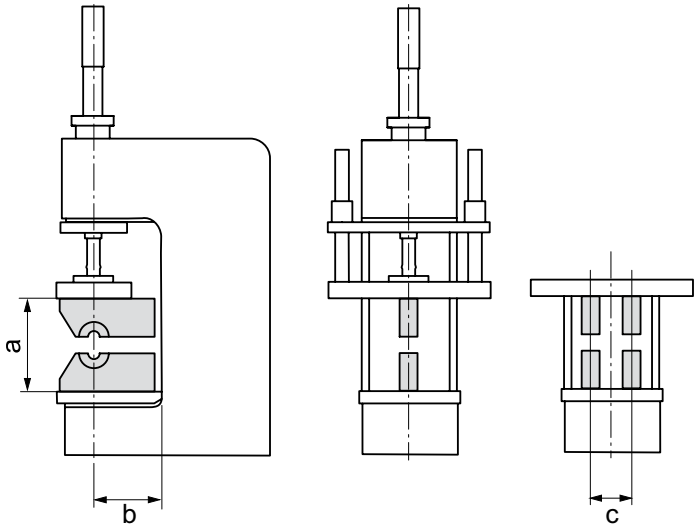


Fig. 6 Dimension of the press area and tool-to-tool spacing

Parameter		Value	
		COMPACT	**COMPACT XL**
Press area	Height (**a**)	min. 328 mm	min. 390 mm
	Depht (**b**)	min. 210 mm	min. 250 mm
Tool-to-tool spacing (**c**)		max. 45 mm, > 45 mm after validation	
Press force		min. 5000 kg	
Press stroke		min. 10 mm, plus MCR diameter for radial loading*	
Upper pressure plate		guided laterally	

*) Explanation: 8 mm Ø reduction + 2 mm reserve + Ø MCR

9.3 Spare parts

The following tables list the most important spare parts that are available for repeat orders and reserve stock.

Spare part	Quantity	Article no.		Comment/type
		Compact	Compact XL	
Slider	8	13400505	13401313	–
Lever	2	13400506	13400506	–
Large cam	4	13400507	13401314	–
Small cam	4	13400508	13401315	–
Push rod	2	13400501	13401318	–
Latch	2	13400543	13401320	–
Small push block	4	13400503	13401316	–
Large push block	4	13400504	13401317	–
Compression spring	8	05004947	05004947	–
Compression spring	8	05004948	05004948	–
Compression spring	2	05004949	05004949	–
Roller bearing (Large cam)	8	05004945	–	BK-1212
Cam shaft	8	–	13401319	BK-1212
Grease	1	08902550	08902550	Shell Retinax CMX, CASTROL MOLY GREASE

9.4 Statement of conformity (template)

EC Declaration of Conformity*

(Translated from German original document)

We,	Oetiker Schweiz AG Spaetzstrasse 11 CH-8810 Horgen SWITZERLAND
hereby deciare in our sole responsibility that the product	Oetiker Compact / - Compact XL
Type	Compact / Compact XL
Modell / Serial number (SN)	Compact / Compact XL with Article Number 13400538 / 13401306 Serial Number SN: ……..
satisfies the following essential requirements of following Directives:	2006/42/EC - Machinery Directive
Harmonized standards applied:	
Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)	EN ISO 12100:2010
Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2019)	EN ISO 13857:2019
Safety of machinery - Minimum gaps to avoid crushing of parts of the human body (ISO 13854:2017);	EN ISO 13854:2017
Other technical standards and specifications applied:	None
Person authorized to compile the technical file in accordance with Annex VII A of Directive 2006/42/EC:	Oetiker Schweiz AG Pascal Moser Spaetzstrasse 11 CH-8810 Horgen SWITZERLAND
Signed in behalf of Horgen: 12.02.2021	Oetiker Schweiz AG
……. Automatic Assembly Tools Manager (Pascal Moser)	……. Legal Entity Manager Oetiker Schweiz AG (Yvonne Zampatti)

**Original declaration of conformity is enclosed with the product!*

10 Help and Support

If you need help or technical support, contact the appropriate Oetiker service center.

See www.oetiker.com for further information.

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