



INSTRUCTION MANUAL

Special tool SW45

Removal and installation tool for the repair of joints



16971109
Edition 10.2025
Printed in Germany



**Read and observe this
instruction manual before first
machine start-up!
Retain for future use!**

IDENTIFICATION DATA

Identification data

Enter the identification data of the special tool here. You will find this information on the vehicle identification plate.

Type: SW45

Serial number: _____

Year of construction: _____

Address of the manufacturer

WALTERSCHEID GmbH

Street: Hauptstraße 150

Town: 53797 Lohmar / Germany

Tel.: + 49 (0) 22 46 12 - 0

Internet: www.walterscheid.com

E-mail: info@walterscheid.com

Formal remarks to this instruction manual

Date of issue: Edition 10.2025

© Copyright WALTERSCHEID GMBH, 2025

All rights are reserved.

Reprinting, even in part, is only permitted with the consent of WALTERSCHEID GMBH.



Printed in Germany



**Read and observe this
instruction manual before first
machine start-up!
Retain for future use!**

Preface

Dear customer,

You have chosen a top quality product from the wide product range of WALTERSCHEID GMBH. We thank you for the confidence you have shown in us.

Upon receiving the special tool, check to ensure that it has not been damaged in transit and that no parts are missing! Check to ensure that the delivery of the special tool is complete, including all ordered special equipment, according to the delivery note. Compensation for damages can only be considered where loss or damage is notified immediately!

Read and observe this instruction manual before putting the product into operation, especially the safety instructions. After reading the instruction manual thoroughly, you can make full use of your newly acquired special tool and enjoy its advantages.

Please make sure that all operators of the special tool read this instruction manual before they put the special tool into operation.

If you have any questions regarding the special tool or this instruction manual, please contact us.

Regular maintenance and servicing of the special tool and timely replacement of worn and/or damaged parts increase the life expectancy of your special tool.

Users' comments

Dear reader,

Our instruction manuals are updated at regular intervals. Your improvement suggestions will help us to continually make this instruction manual more users friendly. Please send us your suggestions by fax or email:

WALTERSCHEID GMBH

Street: Hauptstraße 150

Town: 53797 Lohmar / Germany

Tel.: + 49 (0) 22 46 12 - 0

E-mail: info@walterscheid.com

CONTENTS

Contents

1	Information for the user.....	6
1.1	Purpose of this document	6
1.2	Location information in the instruction manual.....	6
1.3	Presentation modes	6
1.4	Terms used	7
2	Safety instructions.....	8
2.1	Safety awareness at work	8
2.2	Organisational steps to be taken.....	9
2.2.1	Obligations on the part of the operating company	9
2.2.2	Obligations of the operator	10
2.2.3	Qualification of persons	10
2.3	Product safety	12
2.3.1	Using the special tool safely	12
2.3.2	Safety devices and safeguards.....	12
2.3.3	Modifications	12
2.3.4	Spare parts and parts subject to wear and tear as well as auxiliary material.....	13
2.3.5	Guarantee and Liability	13
2.4	Basic safety instructions.....	14
2.4.1	General safety and accident prevention instructions	14
2.4.2	Using the special tool.....	14
2.4.3	Hydraulic system.....	15
2.4.4	Cleaning, servicing and maintaining	16
2.5	Action-related safety instructions and important information	17
2.5.1	Action-related safety instructions	17
2.5.2	Important information	18
2.6	Warnings and instruction hints	19
2.6.1	Warnings	19
2.6.2	Placement of the warnings and instruction hints	21
2.7	Dangers in the event of failure to observe the safety and warning instructions	22
3	Scope of delivery / scope of equipment.....	23
4	Product description	24
4.1	Intended use.....	24
4.2	Danger zone and danger points.....	25
4.3	Type plate and CE marking.....	25
4.4	Technical data	26
4.5	Conformity	27
5	Initial commissioning	28
6	Operating the special tool	30
6.1	Moving the hydraulic cylinders	32
7	Removing bearing bushes	34
8	Installing bearing bushes	52
9	Clean the bearing bushes before removal.....	63

10	Cleaning, servicing and maintaining	65
10.1	Hydraulic system.....	65
10.1.1	Marking of hydraulic hoses lines	67
10.1.2	Maintenance times	67
10.1.3	Inspection criteria for hydraulic hoses lines.....	68
10.2	Oil level & oil changes.....	69
11	EC Declaration of Conformity.....	70
12	Spare part list.....	73

INFORMATION FOR THE USER

1 Information for the user

The chapter Notes for the user provides information on the use of the instruction manual.

1.1 Purpose of this document

This instruction manual:

- explains how to operate and maintain the special tool.
- provides important information on the safe and efficient handling of the special tool.
- is a component of the special tool and must be kept within easy reach of the special tool.
- must be retained for future use.
- must be passed on to the buyer if the special tool is resold.

1.2 Location information in the instruction manual

All orientation directions in this instruction manual are indicated as seen in the direction of the front of the special tool. The replacement journal is always on the left.

1.3 Presentation modes

Operational instructions and consequential reactions

Operations to be performed by the operator are presented as numbered instructions. Follow these steps in the order in which they are given. The reaction (if any) to a given step is indicated by an arrow. Example:

1. Operational instruction 1
→ Reaction of the special tool to instruction step 1
2. Operational instruction 2

Enumerations

Enumerations without any mandatory order are presented as a list of points. Example:

- Point 1
- Point 2

Item numbers in figures

Digits in round brackets refer to item numbers in illustrations. The first digit refers to the figure, the second digit to the item number in the figure.

Example (Fig. 3/6)

- Figure 3
- Item 6

1.4 Terms used

The term ...	called ...
third person	... any person other than the operator.
Hazard	... the source of a possible injury or damage to health.
Manufacturer	... the company WALTERSCHEID GMBH.
Control devices	... the component that is directly actuated by the operator e.g. by applying pressure. An control device may be a control lever, toggle switches, push button, rotary switch, etc.

SAFETY INSTRUCTIONS

2 Safety instructions

This chapter contains important information for the owner and the operator regarding the safe and trouble-free operation of the special tool.



Observe all of the safety instructions in this instruction manual!

Most accidents are caused by the simplest safety rules not being observed.

By observing all safety instructions in this instruction manual, you can help to prevent the occurrence of accidents.

2.1 Safety awareness at work

The special tool is constructed in accordance with the state of the art and the recognised safety rules. Nevertheless, the use of the special tool is associated with a risk of hazards and detrimental effects:

- for the life and limb of the operator or of third parties,
- to the special tool itself,
- on other material assets.

For safe operation of the special tool, observe:

- this instruction manual, in particular:
 - the essential safety instructions, the action-related safety instructions and the instructions for actions,
 - the data on use for the intended purpose.
- the warning signs on the special tool,
- the national, generally applicable regulations on occupational safety, accident prevention and environmental protection.

Do not operate the special tool unless it is in completely safe condition.

2.2 Organisational steps to be taken



The instruction manual:

- must always be kept in the location where the special tool is used,
- must always be freely available to the operator and maintenance personnel.

2.2.1 Obligations on the part of the operating company

The owner/operator is obliged:

- to observe the national, generally applicable regulations for employee protection, accident prevention and environmental protection,
- to allow only such persons to work with/on the special tool as:
 - are well acquainted with the standard regulations concerning occupational safety and accident prevention,
 - have been instructed on how to work with/on the special tool,
 - have read and understood this instruction manual.
- to keep all of the warning signs on the special tool in a legible state,
- to renew damaged warning signs,
- to provide the necessary personal protective equipment, such as, for example:
 - protective goggles,
 - work gloves according to DIN EN 388,
 - safety shoes,
 - protective clothing,
 - skin protection care, etc.

SAFETY INSTRUCTIONS

2.2.2 Obligations of the operator

Before starting work, all persons entrusted to work with/on the special tool are required to:

- to observe the national, generally applicable regulations for employee protection, accident prevention and environmental protection,
- read and observe the chapter "Basic safety instructions", starting on page 14 of this instruction manual,
- read the chapter "Warning signs and instruction hints", starting on page 19 of this instruction manual and observe the warning signs when operating the special tool,
- familiarise themselves with the special tool,
- to read the chapters of this instruction manual, which are important for the execution of his/her work tasks.

If the operator determines that a device is not safety-related, the operator must remove this defect immediately. If this is not part of the work duty of the operator or if appropriate factual knowledge is missing, the operator must report the defect to the supervisor or to the owner/operator.

2.2.3 Qualification of persons



Only trained and instructed persons may work with/on the special tool. The owner/operator must clearly define and allocate the operating, maintenance and servicing tasks and responsibilities.

A person in training may only work with/on the special tool under the supervision of an experienced person.

The owner/operator may only carry out the work described in this instruction manual.

Only specialised workshops may carry out work on the special tool which requires particular specialist knowledge. Specialised workshops have the qualified personnel and appropriate tools required in order to perform this work properly and safely.

That applies to all work:

- not mentioned in these operating instructions,
- marked in these operating instructions with the addition of 'workshop work'.

Personnel Task	A person specially trained for the job ¹⁾	A specifically instructed person ²⁾	A person with specialist training in this field (technical workshop) ³⁾
Loading/transport	X	X	X
Putting into operation	--	X	X
Setting-up/preparation	--	X	X
Operation	--	X	X
Cleaning, servicing and maintaining	--	X	X
Troubleshooting and error rectification	--	X	X
Dispose	X	--	--

Legend:

X..permitted

--..not permitted

- ¹⁾ A person who is able to take on a specific task and may carry it out for suitably qualified company.
- ²⁾ An "instructed person" is one who has received instruction on the tasks entrusted to him/her and on the potential hazards resulting from improper conduct and has been given the required initial training as well as the necessary information on safety and protective devices and safety measures.
- ³⁾ A person is referred to as a specialist (expert) if he/she has received specialised technical training. On the basis of their specialised training and their knowledge of the appropriate regulations, they are able to assess the relevant work situation and recognize possible dangers.

Note: A qualification of the same status as a specialised technical training qualification can be achieved by working for several years in the same branch.

SAFETY INSTRUCTIONS

2.3 Product safety

2.3.1 Using the special tool safely

The special tool should be operated by one person only, with no one else present in the danger zone of the tool during operation. Observe the chapter "Danger zone and danger points", page 25.

2.3.2 Safety devices and safeguards

- Do not operate the special tool unless all of the safety and protective devices are properly fitted and fully functional.
Faulty or dismantled safety and protection equipment can lead to dangerous situations.
- Before operating the special tool, check all safety and protective devices for externally identifiable damage, and ensure that they are in good working order.

2.3.3 Modifications

- Structural changes, additions and modifications to the special tool are prohibited except with prior written approval from the manufacturer.
- In case of unauthorised structural changes, additions or modifications, the conformity declaration and the CE marking of the special tool shall become void.
- Use only original parts or conversion parts and accessory parts approved by the manufacturer, so that:
 - the conformity declaration and the CE marking of the special tool retain their validity,
 - the proper functionality of the special tool is guaranteed.
- The manufacturer does not accept liability for damage caused by:
 - unauthorised changes to the special tool,
 - unapproved modification parts and accessories,
 - welding and drilling on load-bearing parts of the special tool.

2.3.4 Spare parts and parts subject to wear and tear as well as auxiliary material

Replace without undue delay any components not in perfect condition.

Only use original parts from the manufacturer or parts approved by the manufacturer. In the case of the use of spare and wearing parts from third manufacturers it is not guaranteed that they have been designed and fabricated in line with stress and strain and safety requirements.

The manufacturer shall not accept any liability for damage, loss, injury due to the use of non-approved spare and wearing parts or process materials.

2.3.5 Guarantee and Liability

In principle, our "General conditions of sale and delivery" are applicable". These were handed out to the owner/operator at the latest upon the conclusion of the contract.

Warranty and liability claims for personal injury or damage to property shall be excluded if they result from one or several of the following reasons:

- improper use of the special tool,
- improper assembly, commissioning, operation and maintenance of the special tool,
- operating the special tool with faulty safety and protective devices or improperly fitted or inoperative safety and protective devices,
- failure to observe the information in the instruction manual pertaining to commissioning, use and maintenance,
- unauthorised structural changes to the special tool,
- defective monitoring of components which are subject to wear,
- improper repair work,
- catastrophes caused by alien elements and acts of god.

SAFETY INSTRUCTIONS

2.4 Basic safety instructions

Basic safety instructions:

- are generally applicable for the safe operation of the special tool,
- are grouped together in the following sub-chapters.

2.4.1 General safety and accident prevention instructions

- Besides the safety notes in this chapter, observe also the generally applicable national safety and accident prevention regulation!
- Wear your personal protective equipment when working on the special tool!
- Observe the warning signs and instruction hints on the special tool. These labels provide information which is important for the safe and trouble-free operation of the special tool!
- Besides the basic safety instructions in this chapter, also observe the action-related safety instructions in the other chapters!
- Direct any persons in the vicinity of the special tool to leave before putting the special tool into operation! Be especially mindful of children!

2.4.2 Using the special tool

- Before starting work, familiarise yourself with all the devices and operating elements of the special tool as well as with its functions! It is too late to do so after starting work.
- Do not put the special tool into operation unless all the safety and protective devices are installed!
- Access to the operating/danger zone of the special tool is prohibited.
- Externally actuated moving parts of the special tool have squeeze points and shear points!
- Before actuating externally actuated moving parts of the special tool, ensure that there are no persons in the danger zone of the special tool!

2.4.3 Hydraulic system

The hydraulic system is under high pressure.

- Before working on the hydraulic system:
 - depressurise the hydraulic system,
 - disconnect the hydraulic system from the external power source.
- Have the hydraulic hoses lines inspected by a professional at least once a year to ensure that it is in good working order!
- Replace the hydraulic hoses lines in case of visible defects, damage or ageing! Only use original hydraulic hoses lines!
- The hydraulic hoses lines should not be used for longer than six years, including any storage time, which should not exceed two years!

Even with proper storage and under permissible strain, hoses and hose connections are subject to natural ageing. As a result, their storage time and service life are limited. Notwithstanding, the service life can be determined based on empirical values, particularly in accordance with risk potential. Thermoplastic tubing and hydraulic hoses lines are subject to the same reference values.

- Never attempt to seal leaking hydraulic hoses lines with your hand or fingers!

Fluid (hydraulic oil) exiting under high pressure can penetrate the skin and enter the body, causing serious injuries.

In case of injuries due to hydraulic oil, seek medical attention immediately. Risk of infection!

- Never feel for leaks with your bare hand due to the risk of severe infection. When looking for leaks, use appropriate tools/materials (cleaning spray, special leak detector spray)!

SAFETY INSTRUCTIONS

2.4.4 Cleaning, servicing and maintaining

- Perform the designated cleaning, maintenance and servicing tasks on schedule!
- Any mechanical, hydraulic or pneumatic residual energy can trigger unexpected movements of the special tool!
Beware of the presence of residual energies in the special tool when performing maintenance and service. Warnings identify components with residual energy. You can find detailed hints in the respective chapters of this instruction manual.
- Lock out all operating media such as hydraulic oil and compressed air to prevent unauthorised restart!
- Regularly check the firm fit of screws and nuts! Re-tighten loosened screws and nuts!
- Check to ensure that any screw connections unscrewed for cleaning, maintenance and servicing have been screwed tight again.
- Check the functioning of safety and protection equipment after the completion of maintenance work!
- Dispose of oils, greases and filters in the correct and proper manner!
- Any substances and materials used to clean the special tool must be handled and disposed of appropriately, in particular:
 - when working on lubricating systems and devices,
 - when cleaning with solvents!
- Spare parts must at least meet the specified technical requirements of the manufacturer! This is always ensured by the use of original parts!
- Observe the intervals for the maintenance of wearing parts!

2.5 Action-related safety instructions and important information

In the instruction manual there are action-related safety instructions and important information. Signal words and symbols are used to make it possible to recognise action-related safety instructions and important information at a glance.

2.5.1 Action-related safety instructions

Action-related safety instructions:

- warn of residual risks which can arise under certain circumstances or in conjunction with certain actions,
- are to be found in the individual chapters immediately before hazardous activity,
- are identified by the triangular safety symbol and a prefixed signal word. The signal word describes the seriousness of the impending hazard.

DANGER



DANGER

identifies an immediate hazard with a high risk, which will result in very serious physical injury (loss of body parts or long-term damage) or death if it is not avoided.

In the event of non-observance of safety instructions identified with 'DANGER', extremely serious physical injury with possible fatal consequences threatens directly.

WARNING



WARNING

identifies a possible hazard with a medium risk which can result in very serious physical injury or death if it is not avoided.

In the event of non-observance of safety instructions identified with 'WARNING', under certain circumstances very serious physical injury with possible fatal consequences threatens.

SAFETY INSTRUCTIONS

CAUTION



CAUTION

identifies a possible hazard with a low risk which can result in slight or medium physical injury or damage to property if it is not avoided.

In the event of non-observance of safety instructions identified with 'CAUTION', under certain circumstances slight or medium physical injury or damage to property threaten.

2.5.2 Important information

Important information:

- is provided by notes for correct and proper handling of the special tool,
- is provided by application tips for optimum use of the special tool,
- is identified by the following symbols.



IMPORTANT

identifies an obligation to a particular behaviour or an activity for the appropriate handling of the special tool.

Failure to observe these instructions can cause faults on the special tool itself or in its environment.



HINT

identifies application tips and particularly useful information.

These instructions help you to optimally utilise all the functions of your special tool.

2.6 Warnings and instruction hints

2.6.1 Warnings



The special tool has warning signs on it. Warning signs indicate danger points on the special tool and warn of residual risks which can arise under certain circumstances or in conjunction with certain actions.

Always keep these warnings in clean and clearly legible condition! Replace illegible warnings and instruction hints. Request the warning signs from the dealer according to the order number.

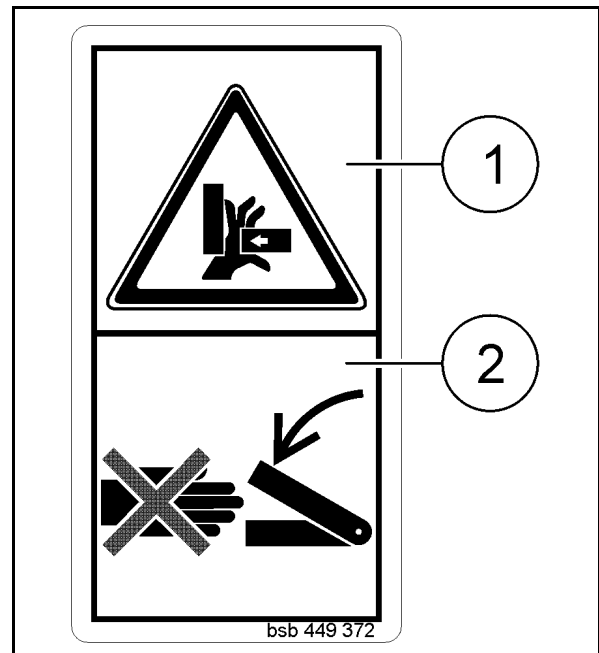
A warning label comprises 2 pictograms:

(1) Pictogram for describing the hazard

This pictogram shows the graphic representation of the hazard, inside of a triangular safety icon.

(2) Pictogram for avoiding the hazard

This pictogram shows the graphic instruction for avoiding the hazard.



SAFETY INSTRUCTIONS

Explanations of the warning labels

The following list contains:

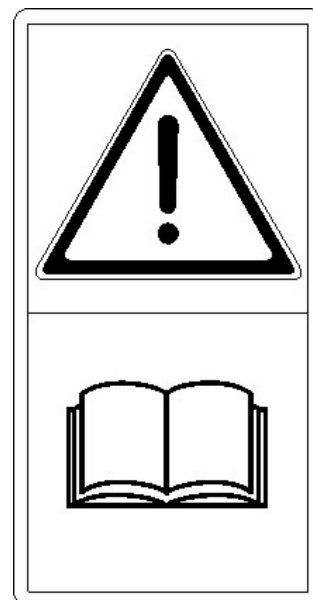
- in the right column, all the warning labels found on the special tool,
- in the left column, the following information regarding the warning on the right:
 - (1) The order number.
 - (2) The description of the hazard, e.g. "Risk of crushing injuries to fingers or hand when moving the hydraulic cylinder to remove a bearing bush due to moving parts approaching stationary parts!"
 - (3) The consequences of disregarding the instructions on avoiding the hazard, e.g. "These hazards can cause extremely severe injuries with amputation of body parts."
 - (4) The instruction(s) for avoiding the hazard, e.g. "Direct third persons to leave the danger zone of the special tool before moving the hydraulic cylinder."

Order number and explanation

SW44/SW45-030

Read and observe the instruction manual and safety instructions before commissioning the special tool!

Warning



Order number and explanation

SW44/SW45-030

Risk of crushing injuries to fingers or hand, caused by accessible moving parts of the machine!

This hazard can cause extremely severe injuries with amputation of body parts.

- Never reach into the danger point while machine parts are able to move.
- Direct third persons to leave the danger zone before actuating the hydraulic hand pump.

Warning



2.6.2 Placement of the warnings and instruction hints

The following figures show the arrangement of the warning signs on the special tool.

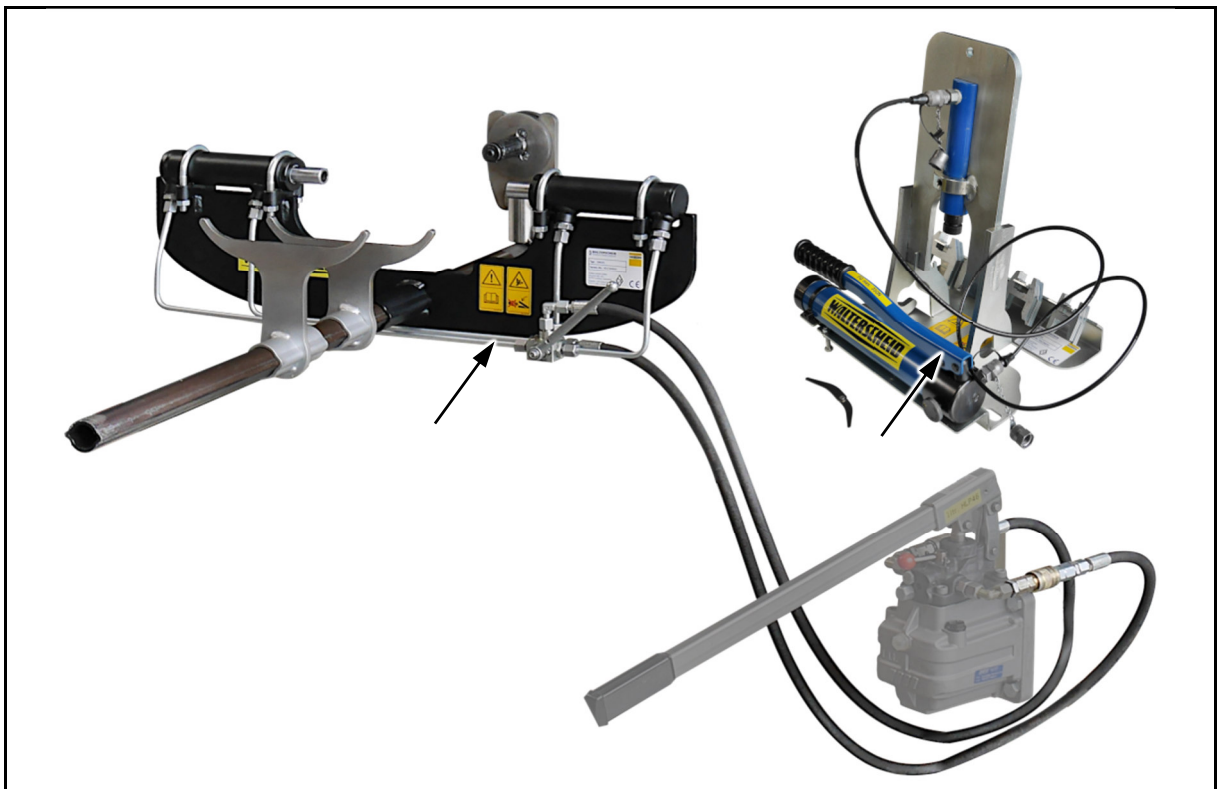


Fig. 1

SAFETY INSTRUCTIONS

2.7 Dangers in the event of failure to observe the safety and warning instructions

Failure to observe the safety instructions and warnings can cause:

- hazards for persons, the environment and the special tool, such as:
 - o Hazard of persons due to non-secured working areas,
 - o failure of important functions of the special tool,
 - o failure of prescribed methods of maintenance and service,
 - o Hazard of persons by mechanical and chemical influences.
- lead to the loss of all claims for damages.

3 Scope of delivery / scope of equipment

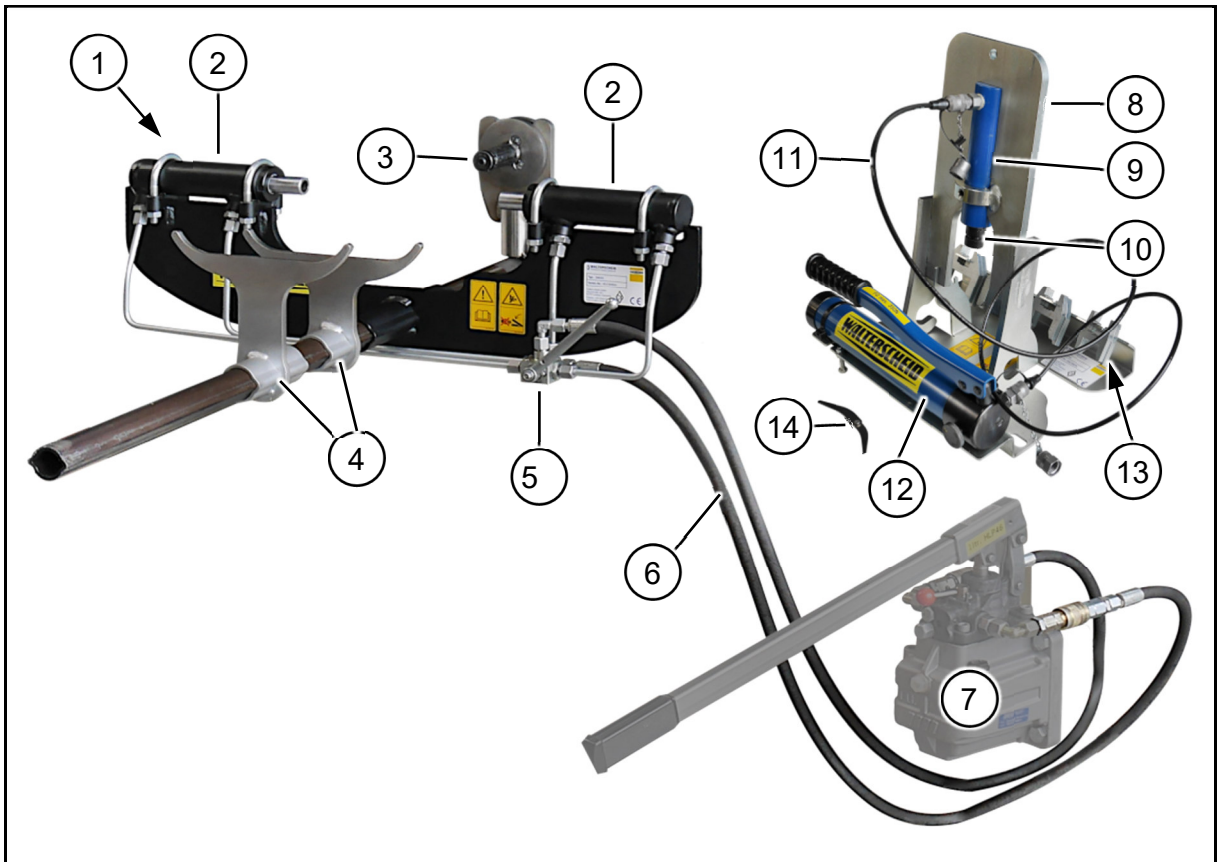


Fig. 2

- (1) Base frame
- (2) Hydraulic cylinder, double-acting
- (3) Fixture, locating washer and spreader
- (4) Racks
- (5) Three-way valve
- (6) Hydraulic hose line
- (7) Hydraulic hand pump (not included in scope of delivery, order no. 1697106)
- (8) Ejector SW45
- (9) Hydraulic cylinder, single-acting
- (10) Pusher support
- (11) Pressure hose
- (12) Hydraulic hand pump
- (13) Pusher
- (14) Clamping spatula (journal guiding tool)

PRODUCT DESCRIPTION

4 Product description

This chapter contains:

- comprehensive information on the structure of WALTERSCHEID Special Tool SW45,
- the designations of the individual assemblies and control devices.

If at all possible, read this chapter with the special tool in front of you. This is the best way to familiarise yourself with the special tool.

4.1 Intended use

WALTERSCHEID Special Tool SW45 is a hydraulically assisted removal and installation tool. It is intended exclusively for use by qualified personnel in the removal and installation of needle bearing bushes from the connecting, inboard and double yokes of agricultural PTO driveshafts during the repair of universal joints. The special tool should only be operated using the manufacturer-supplied manual hydraulic pumps which are described in chapter 3 Scope of delivery / scope of equipment of this instruction manual.

The use for the intended purpose also comprises:

- the observance of all hints in this instruction manual,
- compliance with the maintenance and upkeep work prescribed for the special tool,
- the exclusive use of original parts.

Uses other than those listed above are prohibited and are not considered to be for the intended use.

For damage/loss/injury resulting from use not for the intended purpose:

- the operator/owner shall bear the sole responsibility,
- the manufacturer shall accept no liability at all.

4.2 Danger zone and danger points

The danger zone is located between the yoke sitting in the fixture and the piston rods of the two hydraulic cylinders during the hydraulically assisted immobilisation of the yoke in the special tool and between the yoke and the pusher during the hydraulically assisted removal/installation of a bearing bush from/in a yoke.



Do not reach into the danger zone during the hydraulic movement of the hydraulic cylinders.

In the danger zone, the danger points create hazards which cannot be entirely prevented through the functional safety of the special tool. The hazards are continuously present.

Danger points are indicated by warning signs on the special tool. These warning signs warn of the residual risks.

In this operating manual, residual risks of the special tool are indicated in safety notices associated with operating steps.

4.3 Type plate and CE marking

The following illustration shows the arrangement of the rating plate and the CE marking.



The entire marking has the value of a document and must not be changed or rendered illegible.

The rating plate includes the following information:

- Type
- Serial no.
- Manufacturer

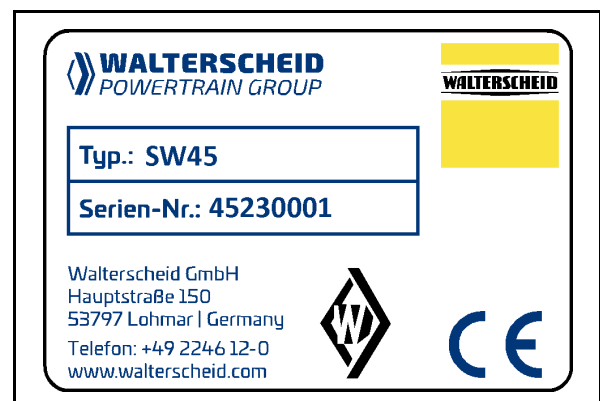


Fig. 3

PRODUCT DESCRIPTION

4.4 Technical data

Base frame SW45:		
Weight:	kg	27
Dimensions - Length - Width - Height	mm	
		800
		410
		280
Ejector SW45:		
Weight:	kg	6
Dimensions - Length - Width - Height	mm	
		410
		200
		100
Manually actuated hydraulic pump:		
Weight:	kg	7
Dimensions - Length - Width - Height	mm	
		330
		280
		170
Hydraulic oil:		CH 15 V
Maximum operating pressure:	bar	400
Total oil volume:	cm³	185

4.5 Conformity

The WALTERSCHEID Special Tool SW45 for the removal of bearing bushes from connecting, inboard and double yokes of agricultural PTO driveshafts meets the essential safety and health requirements of the following directive and standards:

- Directive 2006/42/EC
- EN ISO 12100:2010
- EN ISO 4413:2010

The manufacturer confirms that the special tool SW45 meets the essential safety and health requirements:

- by the issue of the conformity declaration,
- by applying the CE marking to the special tool.

In the case of non-approved structural alterations as well as add-ons or conversions:

- the conformity declaration and the CE marking of the special tool lose their validity,
- warranty and liability claims in the case of physical injury and damage to property shall be excluded by the manufacturer,
- the operating company shall be held liable.

INITIAL COMMISSIONING

5 Initial commissioning

The special tool should only be operated using the manufacturer-supplied manual hydraulic pumps which are described in chapter 3 Scope of delivery / scope of equipment of this instruction manual.



- Check the oil level of the manual hydraulic pumps. If necessary, fill up hydraulic oil HLP 46 (6) or CH 15 V (11).
- Ensure that the hydraulic coupling sleeve and the hydraulic coupling plug snap into the connectors of the hydraulic hand pump.

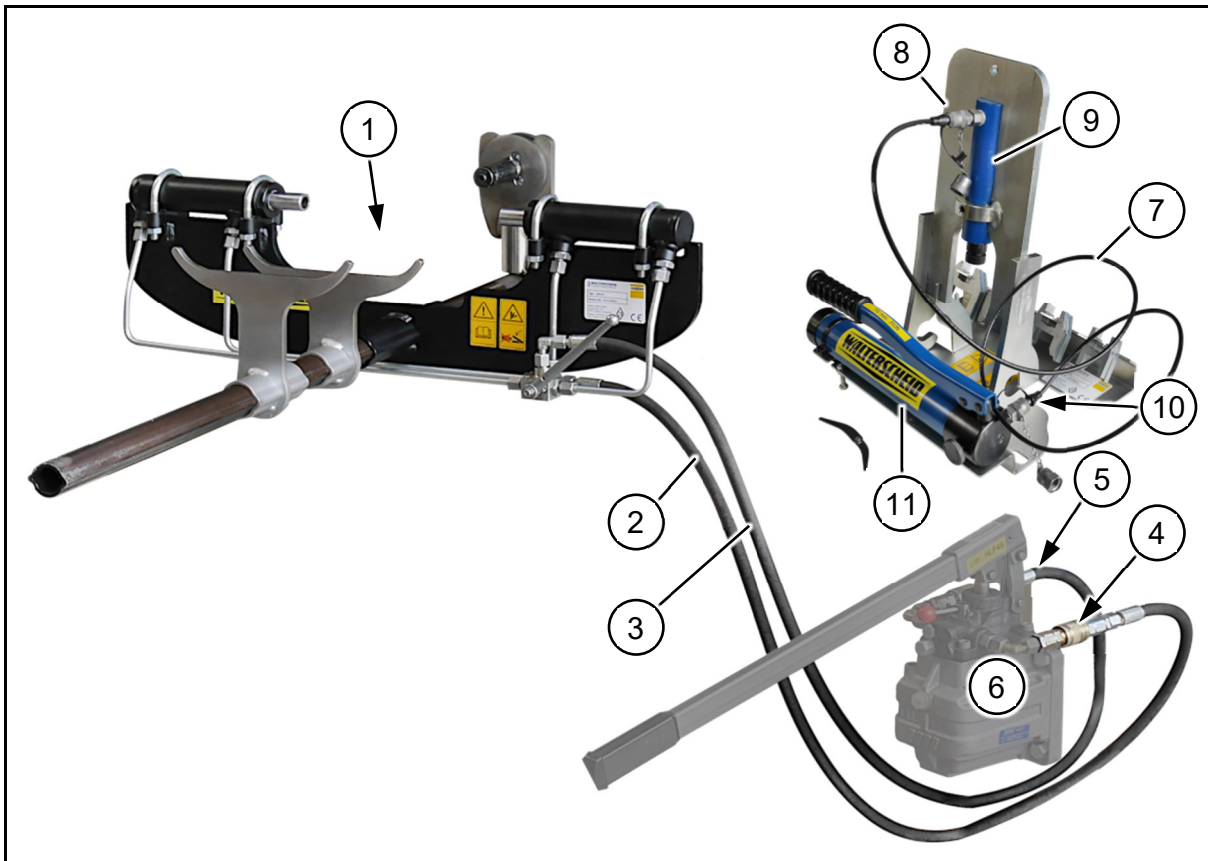


Fig. 4

1. Screw the base frame (1) onto an even, stable work surface using the 4 holes.
2. Connect the hydraulic hoses lines (2) and (3) to the hydraulic coupling sleeve (4) and hydraulic coupling plug (5) on the hydraulic hand pump (6).
3. Assemble and hand-tighten pressure line (7) with connector (8) of hydraulic cylinder (9) and connector (10) of hydraulic hand pump (11).

→ The special tool is ready to use.

OPERATING THE SPECIAL TOOL

6 Operating the special tool

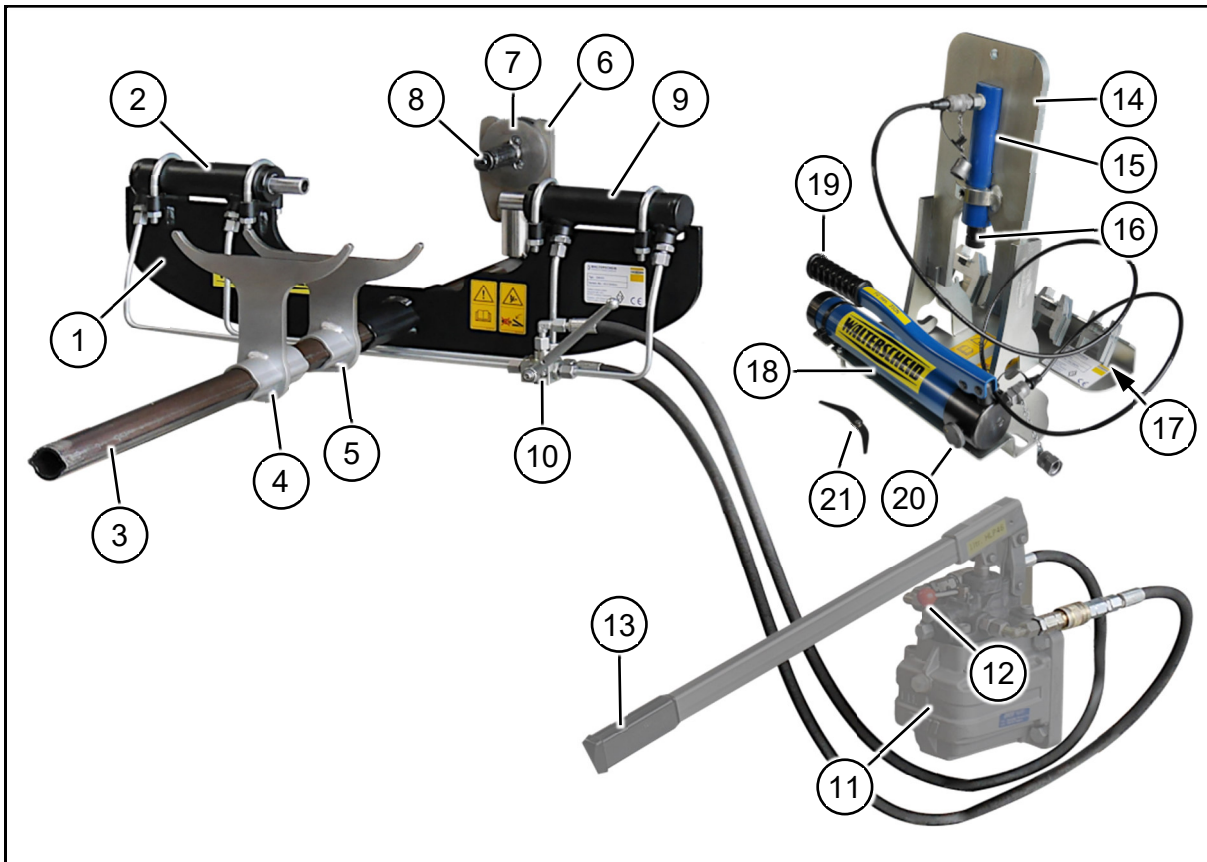


Fig. 5

- (1) Base frame
- (2) Hydraulic cylinder, double-acting, left
- (3) Profile tube for holding the racks
- (4) Rack for holding profile tubes of PTO driveshafts
- (5) Rack for holding joints
- (6) Fixture, height-adjustable
- (7) Locating washer
- (8) Spreader
- (9) Hydraulic cylinder, double-acting, right
- (10) Three-way valve, for controlling the travel of the right or left hydraulic cylinder
- (11) Hydraulic hand pump (not included in scope of delivery, order no. 1697106)
- (12) Changeover valve for directing the direction of movement of the hydraulic cylinder
- (13) Hand lever
- (14) Ejector for needle bearing bushes

(15) Hydraulic cylinder, single-acting

(16) Pusher support

(17) Storage for pusher

(18) Hydraulic pump

(19) Hand lever

(20) Drain valve, designed as a handwheel.

- "ON" position = drain valve is closed, and hydraulic cylinder extends when hand pump is actuated.
- "OFF" position = drain valve is open and extended hydraulic cylinder can be pushed back manually.

(21) Clamping spatula

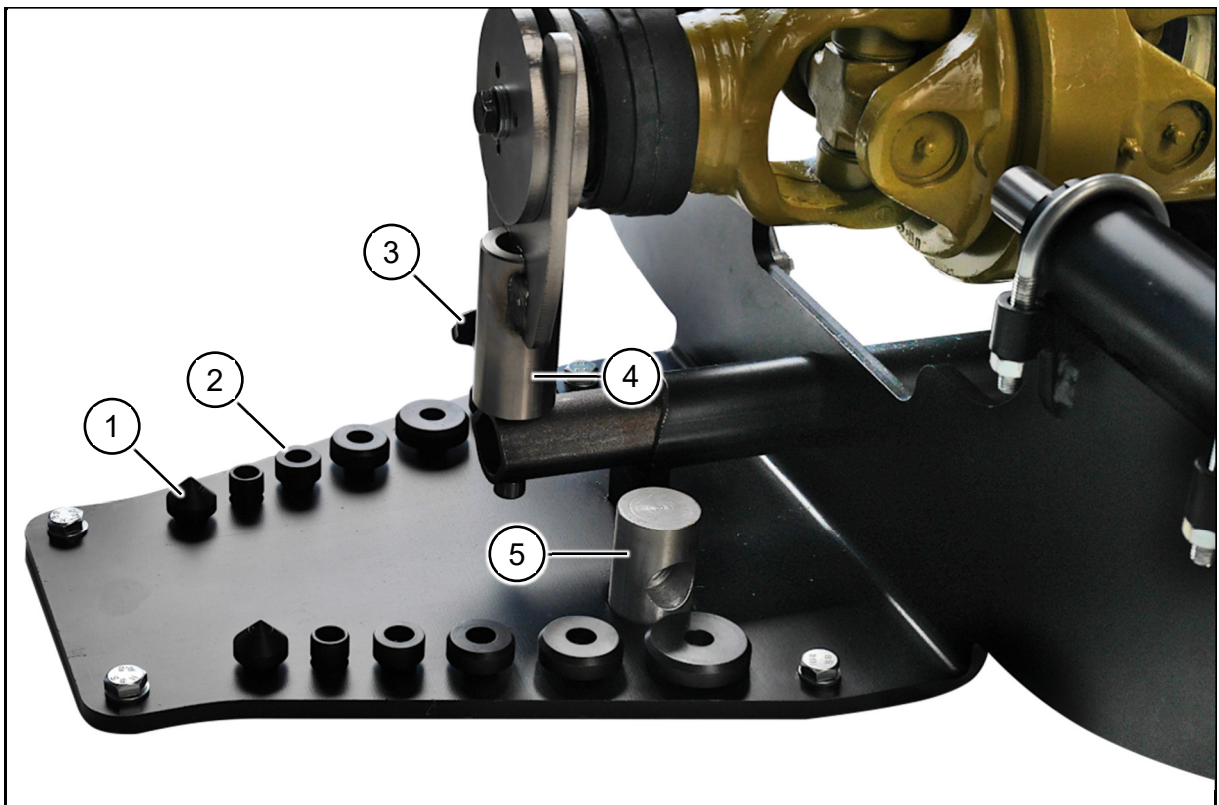


Fig. 6

(1) Expanding mandrel

(2) Mandrel

(3) Star knob screw for locking the height-adjustable fixture

(4) Fixture, height-adjustable

(5) Counter bearing

OPERATING THE SPECIAL TOOL

6.1 Moving the hydraulic cylinders

WARNING



Crushing hazards due to hydraulic cylinder movement when moving parts approach stationary parts!

- Never reach into the danger point as long as parts are able to move.
- Direct third persons to leave the danger zone of the special tool before actuating the hydraulic hand pump.

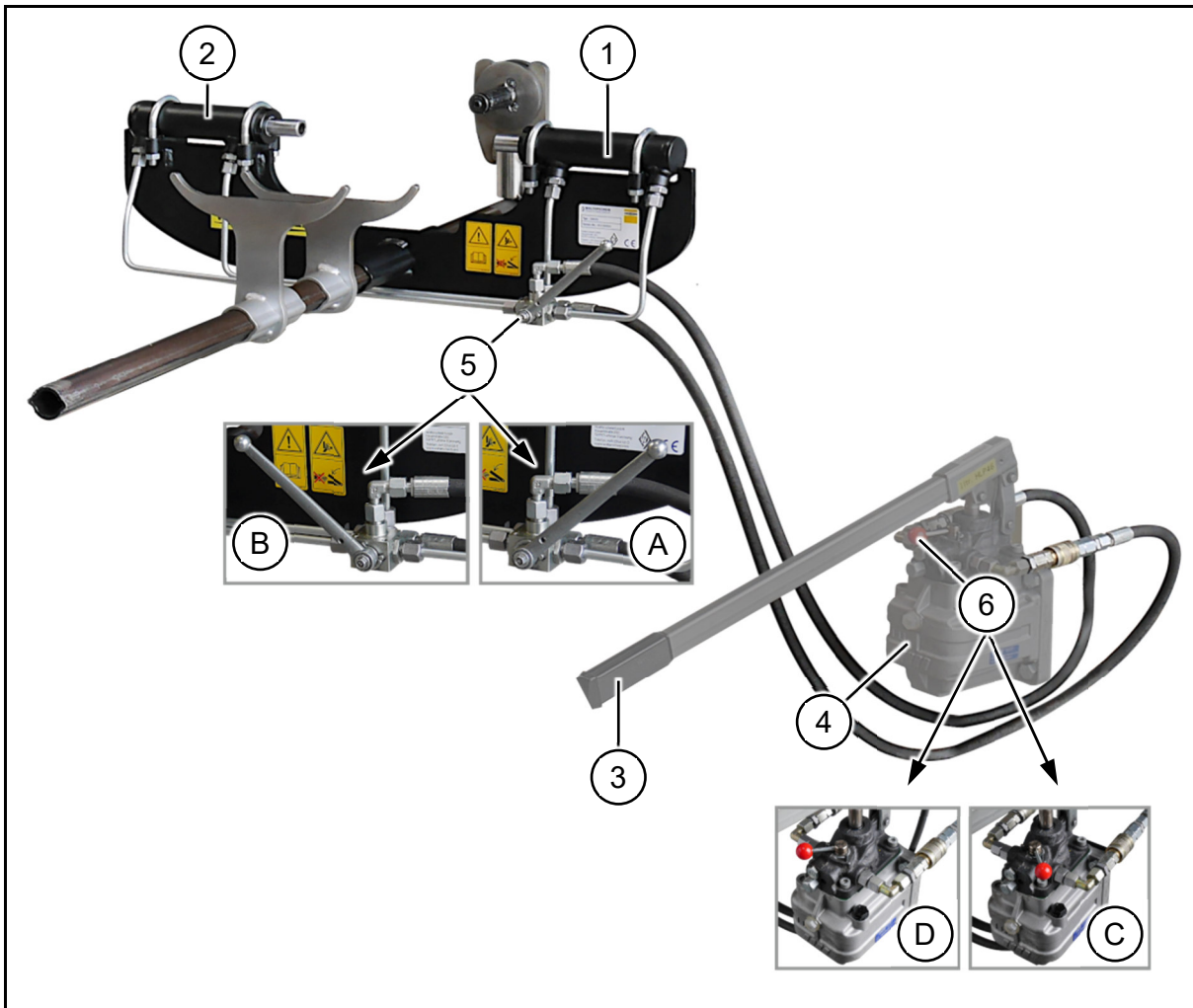


Fig. 7

The two hydraulic cylinders (1) and (2) are used to clamp the joints in the SW45 for removal and installation of the bearing bushes.

The hand lever (3) of the hydraulic hand pump (4) is actuated in order to move the hydraulic cylinders (1) and (2). The position of the adjusting lever (5) on the three-way valve (6) determines whether hydraulic cylinder (1) or (2) will be the one to move.

- To move hydraulic cylinder (1), put the lever in Position A.
- To move hydraulic cylinder (2), put the lever in Position B.

The position of the changeover valve (6) determines the direction of movement of hydraulic cylinder (1) and (2).

- To extend the hydraulic cylinders, put the changeover valve in Position C.
- To retract the hydraulic cylinders, put the changeover valve in Position D.

REMOVING BEARING BUSHES

7 Removing bearing bushes

The basic procedure for removing bearing bushes is explained based on the example of a wide-angle joint and can generally be applied to all joint types.

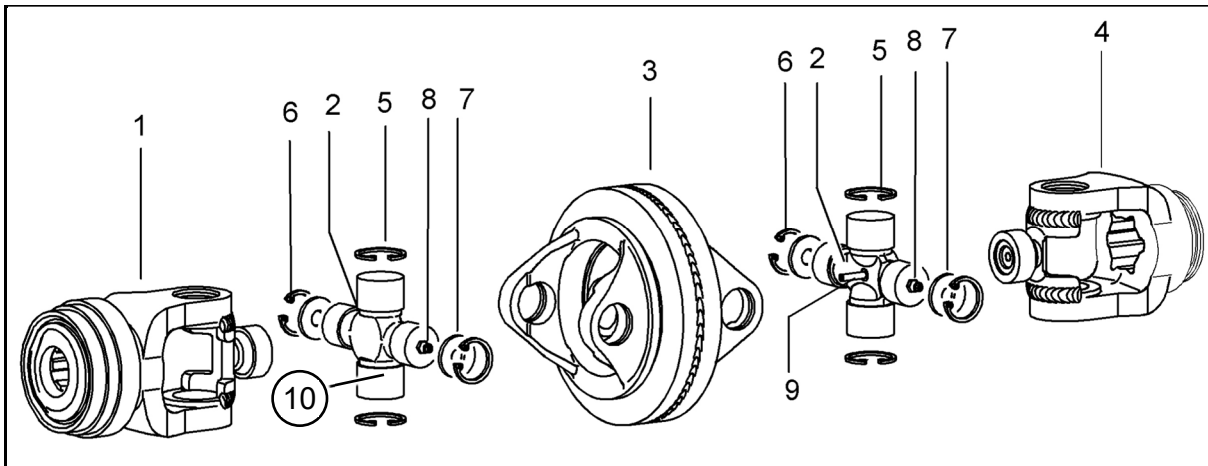


Fig. 8

- (1) Wide-angle connecting yoke
- (2) Wide-angle cross kit
- (3) Wide-angle double yoke
- (4) Wide-angle inboard yoke
- (5) Circlip
- (6) Circlip
- (7) Round plate
- (8) Lubricating nipples
- (9) Lubrication hose
- (10) Bearing bushes, fitted on cross journal

(A) Drift punch SW28 for needle bearing bushes

Order no. 1350300

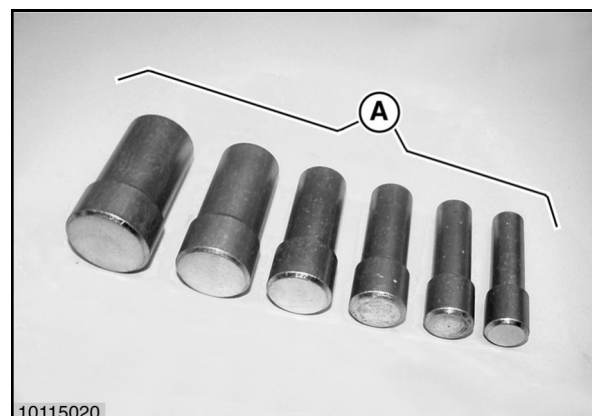


Fig. 9

WARNING



Eye injuries due to ejection of dirt or paint particles during removal of bearing bushes.

Put on safety glasses before removing bearing bushes.

CAUTION



Risk of damage to the cross journals and bearing needles of the bearing bushes when removing bearing bushes from the yoke by striking with a mallet.

At all stages of the bearing bush removal process, only use the special tool in the manner shown and described.



- The series of images shows the proper work sequences for removing bearing bushes with the SW45 special tool; the text provides the necessary instructions.
- With wide-angle joints, when removing bearing bushes, always start with the double yoke, and then move on to the connecting or inboard yoke.

1. Select appropriate drift punch (A).
2. Put on safety glasses.
3. Lightly tap on the drift punch (A) with a mallet to release the circlips.

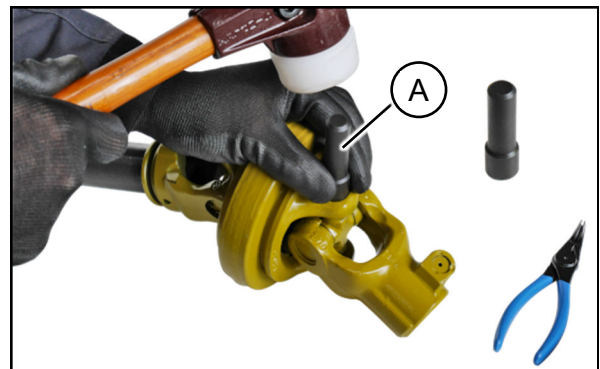


Fig. 10

4. Remove all the circlips and round plates (if any) of the cross to be disassembled.



Fig. 11

REMOVING BEARING BUSHES

→ Joint is prepared for removal of bearing bushes.



Fig. 12

5. Pre-spread the spreader of the locating washer.



Fig. 13

6. Insert the spreader all the way into the connecting yoke, so that the locating washer contacts the connecting yoke (see Fig. 16).



Fig. 14

7. Tighten the spreader.

→ Locating washer is secured in connecting yoke.



Fig. 15

8. Place locating washer in fixture.
9. Place joint and/or profile tube on rack(s).

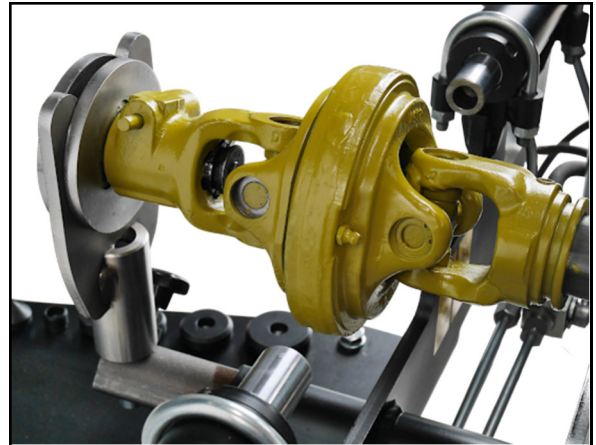


Fig. 16

10. Select suitable mandrel.



Fig. 17

11. Insert mandrels into piston rods of both hydraulic cylinders.



Fig. 18

REMOVING BEARING BUSHES

12. Extend piston rods in the direction of the connecting yoke.
13. Using the star knob screw (1), move and adjust the height to align the connecting yoke opposite the piston rods as shown, so that the mandrels are flush with the holes for the bearing bushes of the connecting yoke.
14. Carefully extend the piston rods further and secure the connecting yoke between the piston rods without pressure.

The adjacent figure shows the correctly secured connecting yoke of a wide-angle PTO driveshaft.

15. Clean and/or oil the bearing bush, if necessary, before removing it. Refer to chapter "9 Clean the bearing bushes before removal", page 63.



Fig. 19



Fig. 20

CAUTION When removing bearing bushes, there is a risk of damage to the fixture if the correct sequence is not observed for W- and WW-joints!



When removing bearing bushes, never start with the connecting or inboard yoke (1) which is secured in the fixture (2) by the spreader. The axis (3) of the connecting or inboard yoke (1) must be flush with the axis (4) of the piston rods (5), so that the piston rods hold the yoke (1), as shown in Fig. 20.

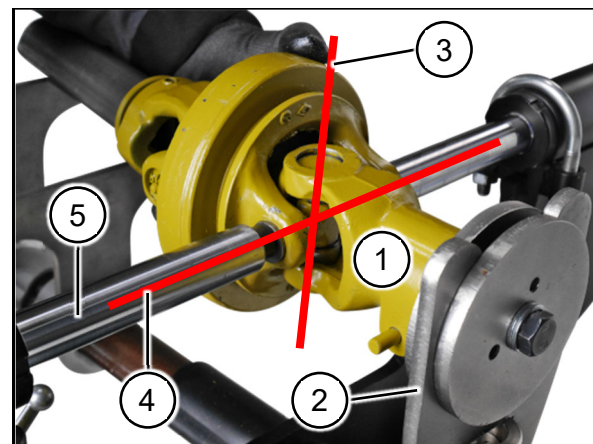


Fig. 21

- 16. Select appropriate pusher.
- 17. Wear safety glasses.



Fig. 22

- 18. Position pusher in pusher holder.
- 19. Remove ejector from rack.

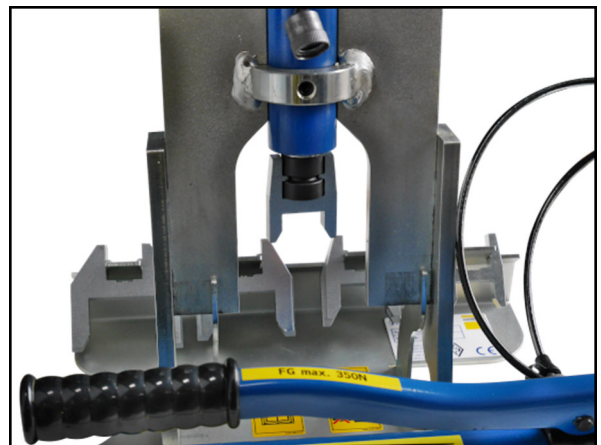


Fig. 23

- 20. Fit ejector on piston rod.



Fig. 24

REMOVING BEARING BUSHES

21. Align the pusher in relation to the bearing bush to be ejected.

Important: The pusher and piston rod must be aligned, as shown in Fig. 25.

22. Close the drain valve on the hand pump.
23. Actuate the hand pump with a maximum weight force of 350 N and push the double yoke down until the double yoke rests on the cross kit.

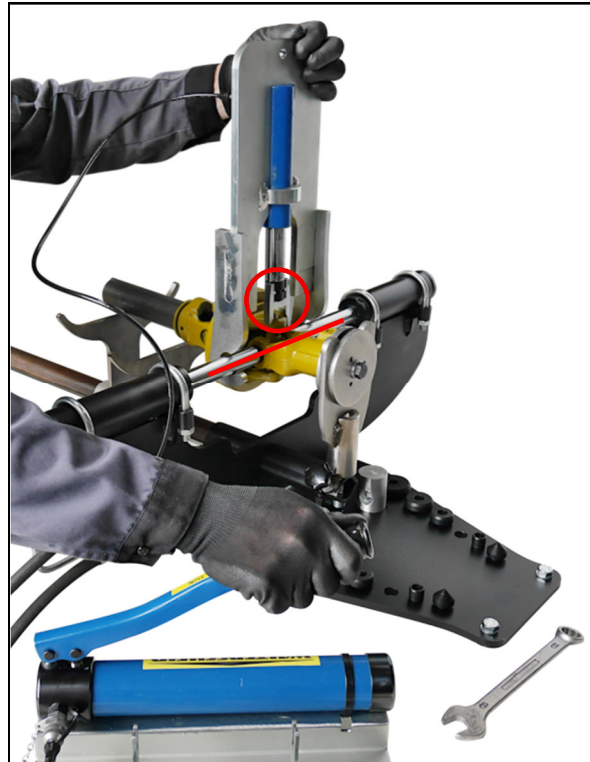


Fig. 25

→ The cross journal pushes the bearing bush partly out of the double yoke.

24. Open the drain valve on the hand pump.
25. Set the ejector down on the rack.



Fig. 26

26. Retract both hydraulic cylinders a little.

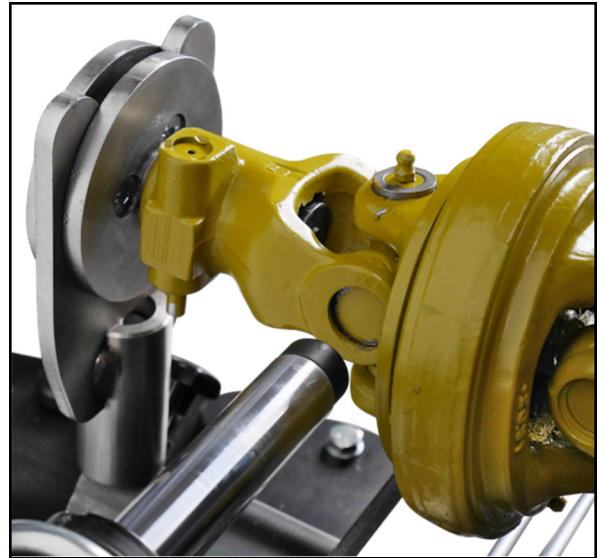


Fig. 27

27. Rotate double yoke 180°.

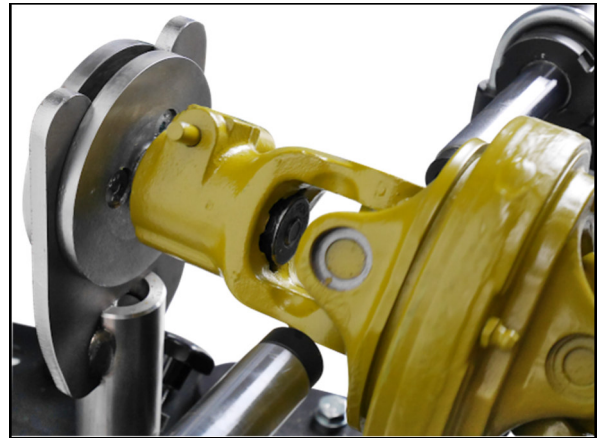


Fig. 28

28. Secure the joint again without pressure.



Fig. 29

REMOVING BEARING BUSHES

29. Fit the ejector on the piston rods and align it in relation to the bearing bush.
30. Close the drain valve on the hand pump.
31. Actuate the hand pump and push the double yoke down until the double yoke rests on the cross kit.



Fig. 30

- Both bearing bushes are now pushed part of the way out of the double yoke.
32. Open the drain valve on the hand pump so that the pusher releases the double yoke.



Fig. 31

33. Use the clamping spatula to help guide the journal.



Fig. 32

34. Move the double yoke so that a gap forms between the cross journal, which has been pushed out of the bearing bush, and the bearing bush.
35. Insert the clamping spatula into the gap as shown in Fig. 35.



Fig. 33



Risk of damage to the cross journals and bearing needles of the bearing bushes when removing bearing bushes from the yoke by striking with a mallet.

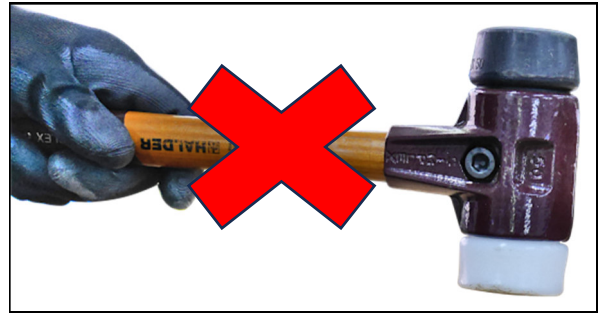


Fig. 34

Fig. 35 shows how the clamping spatula works.

The clamping spatula pushes both the gasket and the cross journal aside slightly. As a result, the front face of the cross journal presses against the front faces of individual needles of the bearing bush. The force is now transmitted from the cross journal to these needles, thus pushing the bearing bush all the way out of the yoke.



Fig. 35

36. Fit the ejector on the piston rods and align it in relation to the bearing bush.
37. Close the drain valve on the hand pump.
38. Actuate the hand pump and push the double yoke down until the yoke rests on the cross kit.
 - The bearing bush has been fully ejected.
39. Open the drain valve on the hand pump.
40. Set the ejector down on the rack.



Fig. 36

REMOVING BEARING BUSHES

41. Remove clamping spatula.



Fig. 37

42. Remove bearing bush.



Fig. 38

43. Retract both hydraulic cylinders a little.

44. Rotate double yoke 180°.



Fig. 39

45. Secure the joint again without pressure.
46. Fit the ejector on the piston rods and align it in relation to the bearing bush.
47. Close the drain valve on the hand pump.
48. Actuate the hand pump and push the double yoke down until the double yoke rests on the cross kit.
→ The bearing bush has been fully ejected.
49. Open the drain valve on the hand pump.
50. Set the ejector down on the rack.
51. Remove the clamping spatula and bearing bush.
52. Remove double yoke.



Fig. 40

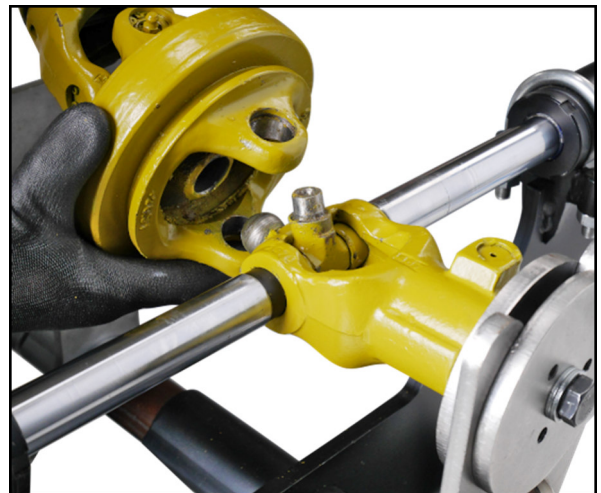


Fig. 41

53. Retract both hydraulic cylinders a little.
54. Release spreader.

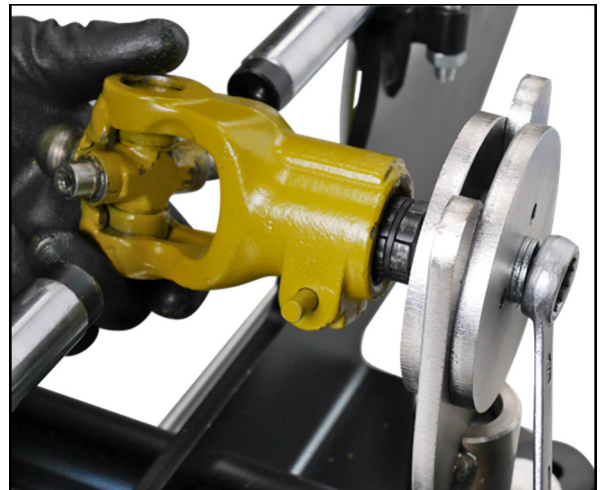


Fig. 42

REMOVING BEARING BUSHES

55. Pull the connecting yoke off of the spreader of the locating washer.



Fig. 43

56. Replace mandrels in piston rods of both hydraulic cylinders with expanding mandrels.

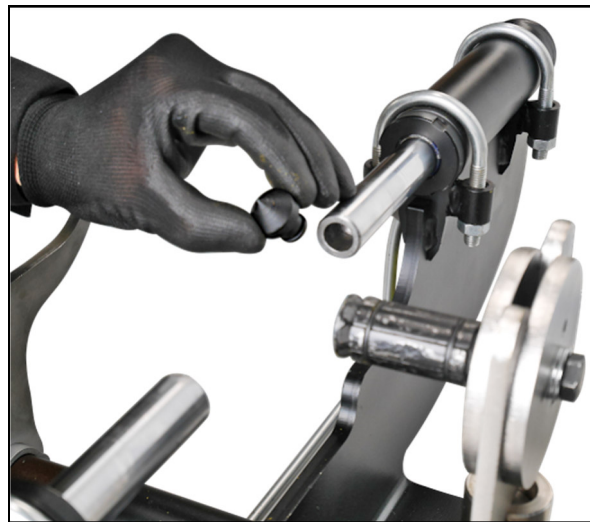


Fig. 44

- The SW45 is prepared for clamping the cross pin of the connecting yoke.



Fig. 45

57. Clamp the connecting yoke between the piston rods as shown.



Fig. 46

58. Select appropriate pusher.
59. Position pusher in pusher holder.



Fig. 47

60. Fit ejector on piston rod.
61. Align the pusher in relation to the bearing bush to be ejected.
62. Close the drain valve on the hand pump.
63. Actuate the hand pump and push the connecting yoke down until the connecting yoke rests on the cross kit.

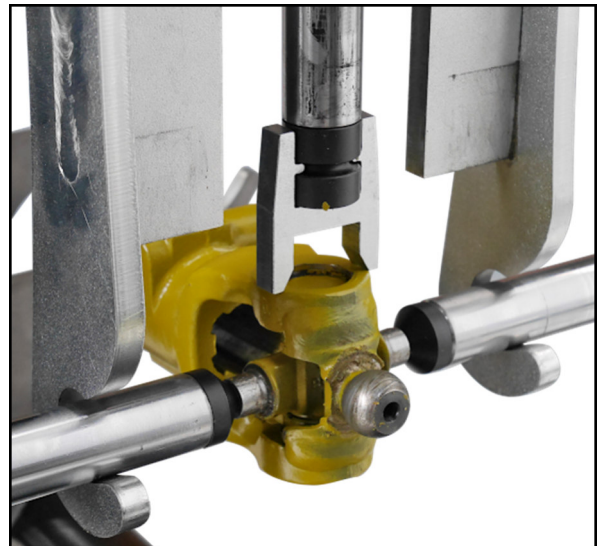


Fig. 48

REMOVING BEARING BUSHES

- 64. Open the drain valve on the hand pump.
- 65. Set the ejector down on the rack.



Fig. 49

- 66. Retract one hydraulic cylinder a little.
- 67. Rotate the connecting yoke 180° and clamp it again.



Fig. 50

- 68. Fit ejector on piston rod.
- 69. Align the pusher in relation to the bearing bush to be ejected.
- 70. Close the drain valve on the hand pump.
- 71. Actuate the hand pump and push the connecting yoke down until the connecting yoke rests on the cross kit.
 - Both bearing bushes are now pushed part of the way out of the connecting yoke.
- 72. Open the drain valve on the hand pump.
- 73. Set the ejector down on the rack.
- 74. Use the clamping spatula to help guide the journal.



Fig. 51



Fig. 52

75. Move the connecting yoke so that a gap forms between the cross journal, which has been pushed out of the bearing bush, and the bearing bush.
76. Insert the clamping spatula into the gap as shown in Fig. 35.



Fig. 53

77. Fit the ejector on the piston rods and align it in relation to the bearing bush.
78. Close the drain valve on the hand pump.
79. Actuate the hand pump and push the yoke down until the yoke rests on the cross kit.
 - The bearing bush has been fully ejected.
80. Open the drain valve on the hand pump.
81. Set the ejector down on the rack.
82. Remove the clamping spatula and bearing bush.
83. Retract one hydraulic cylinder a little.
84. Take the cross journal out of the connecting yoke.



Fig. 54



Fig. 55

REMOVING BEARING BUSHES

85. Take both expanding mandrels out of the piston rods of the hydraulic cylinders.
86. Insert the appropriate mandrel into the piston rod and fit outside bearing onto piston rod.



Fig. 56

87. Clamp the connecting yoke as shown.
88. By extending the piston rod, push the bearing bush into the connecting yoke until the bearing bush can be removed by hand.



Fig. 57

89. Manually remove the bearing bush.



Fig. 58

90. Clean the cross journal.



Fig. 59

91. Clean the holes of the connecting yoke.



Fig. 60

92. If necessary, align the bearing needles in the bearing bush.



Fig. 61

93. Grease the bearing bush with agraset 147.



Fig. 62

INSTALLING BEARING BUSHES

8 Installing bearing bushes

The basic procedure for installing bearing bushes is explained based on the example of a wide-angle joint and can generally be applied to all joint types.

WARNING



Eye injuries due to ejection of dirt or paint particles during installation of bearing bushes.

Put on safety glasses before installing bearing bushes.

1. Select a mandrel appropriate for the size of the bearing bushes to be installed.



Fig. 63

2. Insert the appropriate mandrel into the piston rod and fit outside bearing onto piston rod.
3. Put on safety glasses.



Fig. 64

4. Insert the cross journal into the connecting yoke.



Fig. 65

- Connecting yoke is prepared for installation of bearing bushes.



Fig. 66

5. Slide the connecting yoke onto the spreader of the locating washer.
 6. Tighten the spreader.
- The connecting yoke is secured in the locating washer.



Fig. 67

INSTALLING BEARING BUSHES

7. Align the connecting yoke as shown.
8. Extend the piston rod with counter bearing, so that the outer bearing lightly touches the connecting yoke.



Fig. 68

9. Guide the cross journal by hand and set the bearing bush onto the cross pin with the bearing needles correctly aligned.



Fig. 69

10. Extend the piston rod with mandrel, so that the mandrel lightly touches the bearing bush.

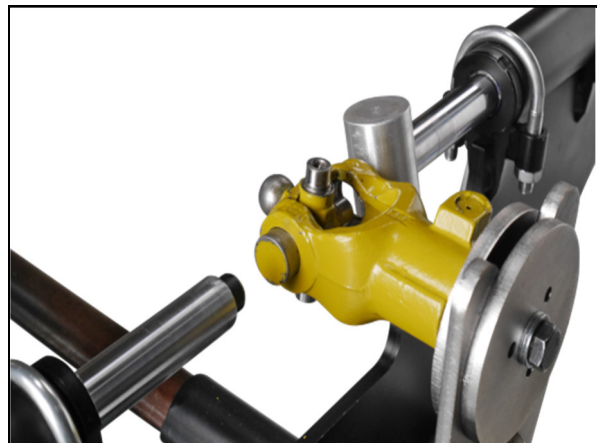


Fig. 70

11. Guide the cross journal by hand.
12. Push the bearing bush over the piston rod with mandrel into the connecting yoke until the ring groove is visible.
→ At the same time, the bearing bush is slid onto the cross journal.



Fig. 71

13. Retract both hydraulic cylinders a little.

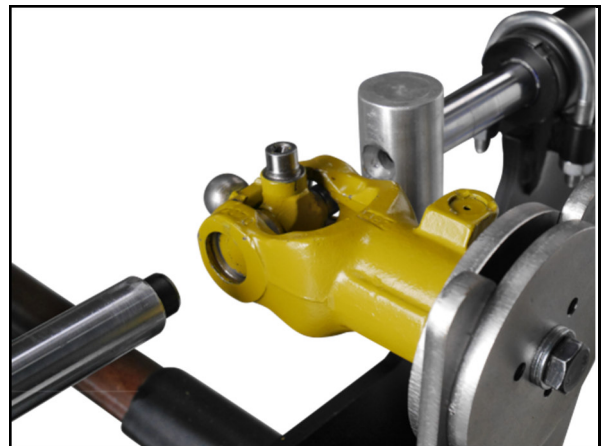


Fig. 72

14. Rotate connecting yoke 180°.
15. Guide the cross journal by hand and set the bearing bush onto the cross pin with the bearing needles correctly aligned.
16. Extend the piston rod with counter bearing, so that the outer bearing lightly touches the connecting yoke.



Fig. 73

INSTALLING BEARING BUSHES

17. Guide the cross journal by hand.
18. Push the bearing bush over the piston rod with mandrel into the connecting yoke until the ring groove is visible.
 - At the same time, the bearing bush is slid onto the cross journal.



Fig. 74

- Both bearing bushes are pushed into the connecting yoke and slid onto the cross journal.



Fig. 75

19. Retract both hydraulic cylinders a little.

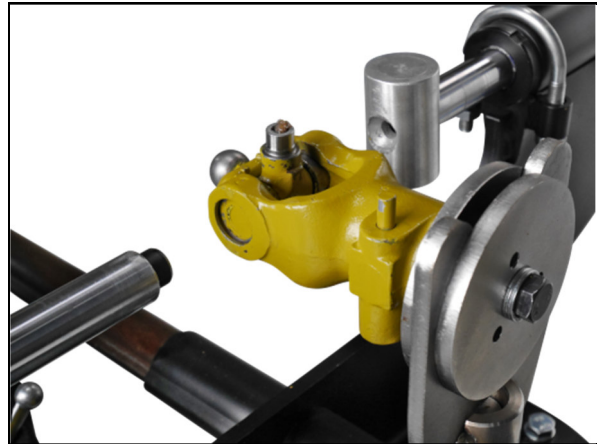


Fig. 76

20. Grease the guide sections (ball and hub collar) (arrow) with agraset 147.
21. Insert ball into guide hub and insert cross journal into double yoke.

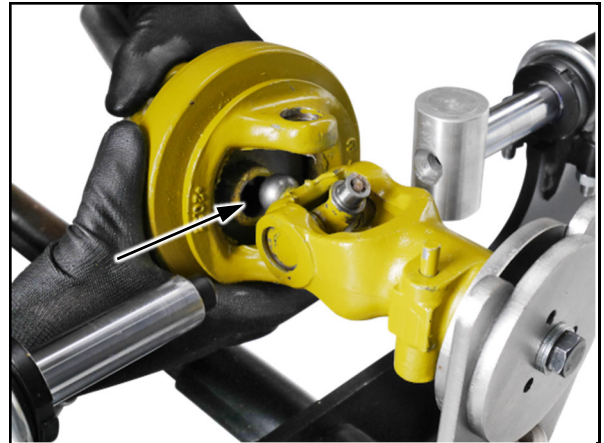


Fig. 77

22. Orient the joint as shown.
23. Extend the piston rod with counter bearing, so that the counter bearing lightly touches the double yoke.

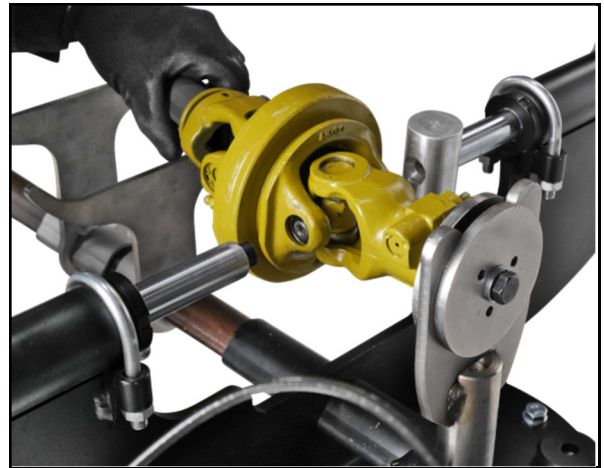


Fig. 78

24. Guide the double yoke by hand and set the bearing bush onto the cross journal with the bearing needles correctly aligned.
25. Place joint on rack.

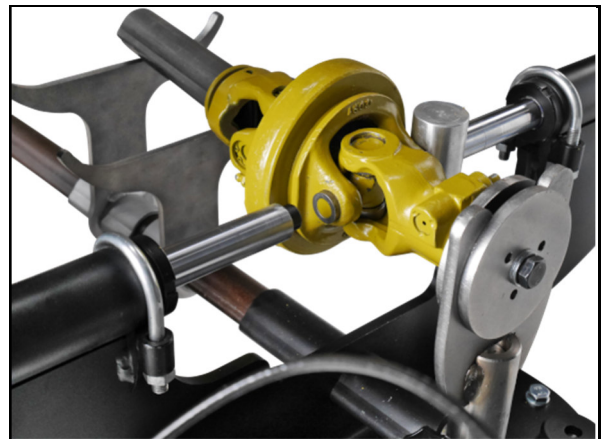


Fig. 79

INSTALLING BEARING BUSHES

26. Using the mandrel, press the bearing bush over the piston rod, first with counter bearing and then on alternating sides (in order to centre the cross journal) into the connecting yoke until the ring groove becomes visible.

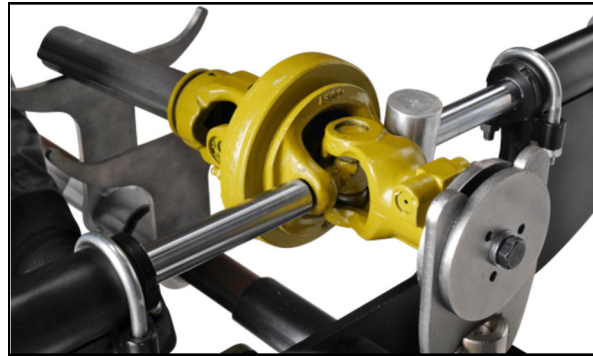


Fig. 80

27. Retract both hydraulic cylinders a little.
28. Rotate yoke 180.
29. Guide the double yoke by hand and set the bearing bush onto the cross journal with the bearing needles correctly aligned.



Fig. 81

30. Orient the joint as shown.
31. Extend the piston rod with counter bearing, so that the counter bearing lightly touches the double yoke.
32. Using the mandrel, press the bearing bush over the piston rod, first with counter bearing and then on alternating sides (in order to centre the cross journal) into the connecting yoke until the ring groove becomes visible.

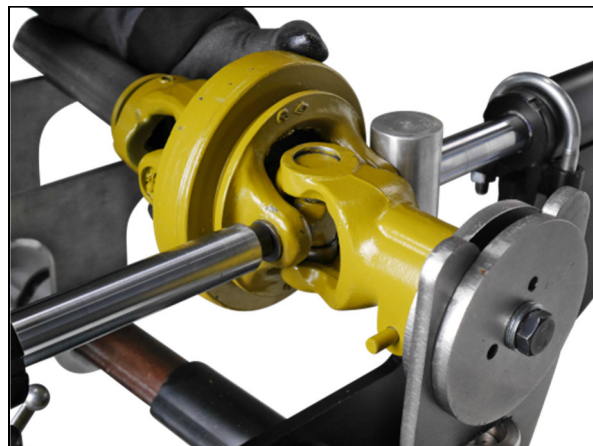


Fig. 82

- 33. Retract both hydraulic cylinders.
- 34. Insert the first circlip into the connecting yoke.
- 35. Rotate yoke 180°



Fig. 83

- 36. Push the bearing bush again in case the ring groove for the second circlip is not visible.



Fig. 84

- 37. Insert the second retaining ring into the connecting yoke.



Fig. 85

INSTALLING BEARING BUSHES

- 38. Rotate yoke 90°.
- 39. Insert the round plate between the bearing bush and the circlip (if necessary).



Fig. 86

- 40. Insert the circlip into the double yoke.



Fig. 87

- 41. Rotate yoke 180°.
- 42. Insert the round plate between the bearing bush and the circlip (if necessary).



Fig. 88

43. Check if the ring groove for the second circlip is visible. If necessary, push the bearing bush again, and insert the circlip into the double yoke.

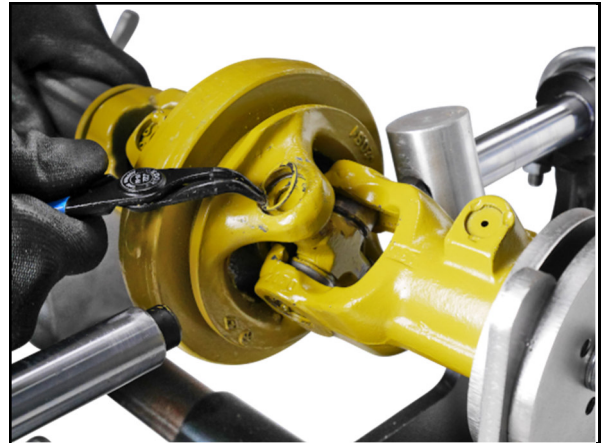


Fig. 89

44. Release spreader.



Fig. 90

45. Pull the yoke off of the spreader of the locating washer.

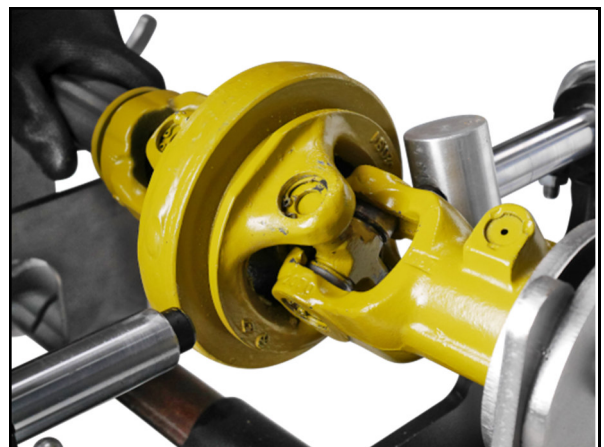


Fig. 91

INSTALLING BEARING BUSHES

46. Tap the pivot arm with a mallet to release the joint.



Fig. 92

47. Move the joint in all directions, checking for ease of movement.
48. Grease the joint.



Fig. 93

9 Clean the bearing bushes before removal

The basic procedure for cleaning bearing bushes is explained based on the example of a Series W joint and can generally be applied to all joint types.



To facilitate the removal of bearing bushes, it may be helpful to first clean any rust or paint residues from the bearing bushes.

WARNING



Eye injuries due to ejection of dirt or paint particles during cleaning of bearing bushes.

Put on safety glasses before cleaning bearing bushes.

1. Remove circlips and insert spreader. Refer to chapter "7 Removing bearing bushes, steps 1 to 10 and 12 to 13, page 35.
2. Insert the appropriate mandrel into the piston rod and fit outside bearing onto piston rod.



Fig. 94

3. Extend the piston rod with counter bearing, so that the outer bearing lightly touches the connecting yoke.
4. Extend the piston rod with the mandrel and push the right bearing bush into the yoke.

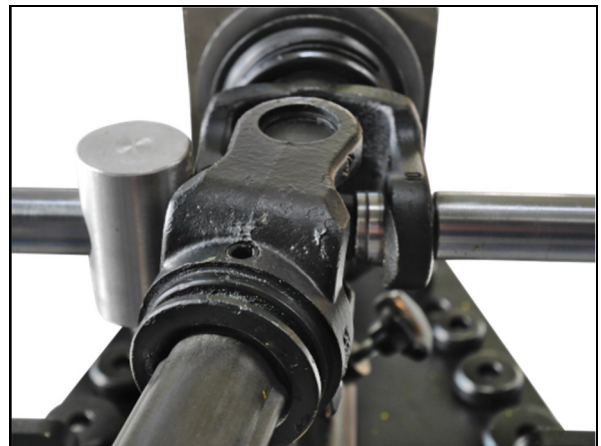


Fig. 95

CLEAN THE BEARING BUSHES BEFORE REMOVAL

5. Clean the bearing bush with sandpaper all around.



Fig. 96

6. Spray bearing bush with rust remover.

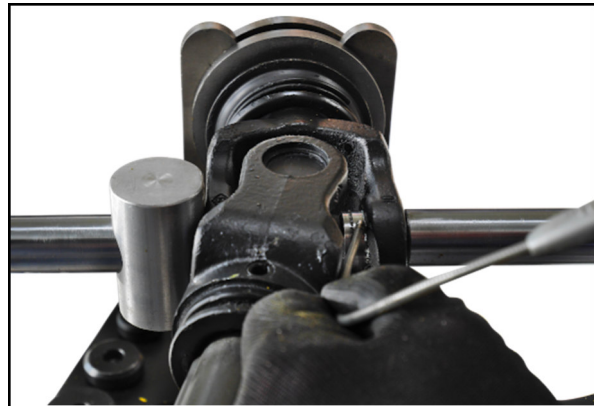


Fig. 97

7. Retract both hydraulic cylinders.
 8. Fit mandrel and counter bearing into and onto the other piston rod as shown.
 9. Clamp the joint again.
 10. Push the left bearing bush into the yoke.
 11. Clean the bearing bush with sandpaper all around.
 12. Spray bearing bush with rust remover.
- Both bearing bushes are free from rust and paint residues.

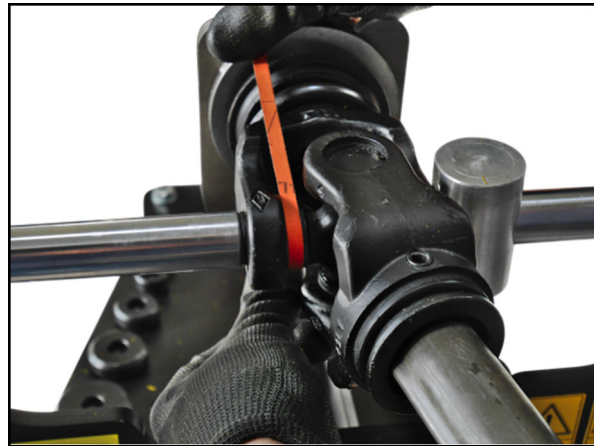


Fig. 98

10 Cleaning, servicing and maintaining



During cleaning, maintaining and servicing observe in addition the hints in the chapters:

- "Obligations of the operator", on page 10,
- "Qualification of persons", on page 10,
- "Basic safety instructions", from page 14,
- "Warnings and instruction hints", from page 19.

Observance of these chapters is in the interest of your safety.

10.1 Hydraulic system

Hydraulic cylinder and hydraulic hand pump are maintenance-free.

WARNING



Persons are at risk of infection if hydraulic oil escapes under high pressure and is injected into the body!

- Only a specialist workshop may be permitted to work on the hydraulic system.
- Depressurise the hydraulic system before starting work on the hydraulic system.
- It is important to use appropriate tools/materials when checking for leaks.
- Never attempt to stop leaking hydraulic hoses lines with your hand or fingers.

Fluid (hydraulic oil) exiting under high pressure can penetrate the skin and enter the body, causing serious injuries.

In case of injuries due to hydraulic oil, seek medical attention immediately! Risk of infection.

WARNING



Damaged or aged hydraulic components can cause severe injuries.

- Never use the special tool with
 - damaged or aged hydraulic components, e.g. gasket sets.
 - with leaky hydraulic cylinder, leaky hydraulic hose line or leaky hydraulic hand pump.

CLEANING, SERVICING AND MAINTAINING



- Ensure that the hydraulic hoses lines are correctly connected.
- Regularly check all hydraulic hoses lines and couplings for damage and contamination.
- Have the hydraulic hoses lines inspected by a professional at least once a year to ensure that it is in good working order.
- Replace the hydraulic hoses lines in case of damage or ageing. Only use original hydraulic hoses lines from the manufacturer.
- The hydraulic hoses lines should not be used for longer than six years, including any storage time, which should not exceed two years.

Even with proper storage and under permissible strain, hoses and hose connections are subject to natural ageing. As a result, their storage time and service life are limited. Notwithstanding, the service life can be determined based on empirical values, particularly in accordance with risk potential. Thermoplastic tubing and hydraulic hoses may be subject to different reference values.

- Dispose of used oil as prescribed. In case of problems with disposal, contact your oil supplier.
- Do not allow hydraulic oil to escape into soil or water.

10.1.1 Marking of hydraulic hoses lines

The label on the fitting (Fig. 99) provides the following information:

- (1) Manufacturer identification of the hydraulic hose line (XXX)
- (2) Date of manufacture of the hydraulic hose line
(23/10 = year / month = October 2023)
- (3) Maximum permissible operating pressure (210 bar)



Fig. 99

10.1.2 Maintenance times

After the first 10 hours of operation and after every 50 hours of operation:

1. Check all components of the hydraulic system for leaks.
2. Tighten any loose screw fittings.

Before each start-up:

1. Check the hydraulic hoses lines for visible faults.
2. Eliminate any chafing points on the hydraulic hoses lines and pipes.
3. Replace worn or damaged hydraulic hoses lines immediately.

CLEANING, SERVICING AND MAINTAINING

10.1.3 Inspection criteria for hydraulic hoses lines



For your own safety:

Replace hydraulic hoses lines immediately in case of any of the following faults:

- Damage to the outside layer down to the lining (e.g. due to chafing, cuts, cracks).
- Embrittlement of the outside layer (as indicated by cracking of the hose material).
- Unnatural warping of the hydraulic hose line, e.g.. Separation of layers, formation of bubbles, crushing or kinks.
- Leaks.
- Damage, deformation or leaking of the hose fitting. Minor superficial damage does not require replacement.
- Displacement of the hose out of the fitting.
- Corrosion of the fitting resulting in reduced functionality and rigidity.
- Improperly installed hydraulic hoses lines, e.g. failure to observe bending radii, installation over sharp edges.
- The 6-year duration of use has been exceeded.

The permissible period of use ends 6 years from the date of manufacture of the hydraulic hose line.

Example (Fig. 99): The date of manufacture of the hydraulic hose line is indicated on the fitting, e.g. (23 / 10 = year / month = October 2023). The permissible period of use would then end in October 2029.

10.2 Oil level & oil changes



- Check the oil level of the hydraulic hand pump before initial commissioning, and regularly check the oil level of both hydraulic pumps thereafter. If necessary, fill up hydraulic oil HLP 46 or CH 15 V. Refer to chapter "Initial commissioning", page 28.
- Change the oil as needed but at least once a year.

1. Ensure that the oil level in the hand pump is sufficient.

The oil filling port is located behind the black protective cap (1).

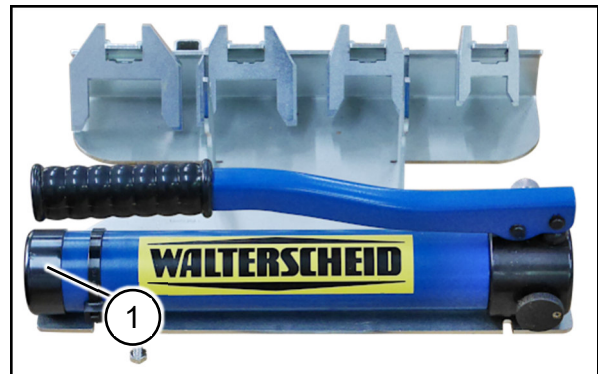


Fig. 100

EC DECLARATION OF CONFORMITY

11 EC Declaration of Conformity

EC Declaration of Conformity

according to the EC Machinery Directive 2006/42/EC, Annex II, 1. A

Manufacturer:

WALTERSCHEID GmbH
Hauptstraße 150
53797 Lohmar / Germany

Person residing within the Community authorised to compile the relevant technical file:

WALTERSCHEID GmbH
Hauptstraße 150
53797 Lohmar / Germany

Description and identification of the machinery:

Designation:	WALTERSCHEID special tool for removing needle bearing bushes from connecting, inboard and double yokes of agricultural PTO driveshafts during universal joint repair.
Type:	SW45
Serial number:	
Commercial name:	Special tool SW45

It is expressly declared that the machinery fulfils all relevant provisions of the following EC Directives:

Directive 2006/42/EC	Directive on machinery OJ L 157, 9.6.2006, p. 24–86
----------------------	--

Reference to the applied harmonised standards as per Article 7(2):

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)
EN ISO 4413:2010	Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413:2010)

Lohmar, October 2025

City, date

Signature



Position Managing director



EC DECLARATION OF CONFORMITY

- Blank page -

12 Spare part list

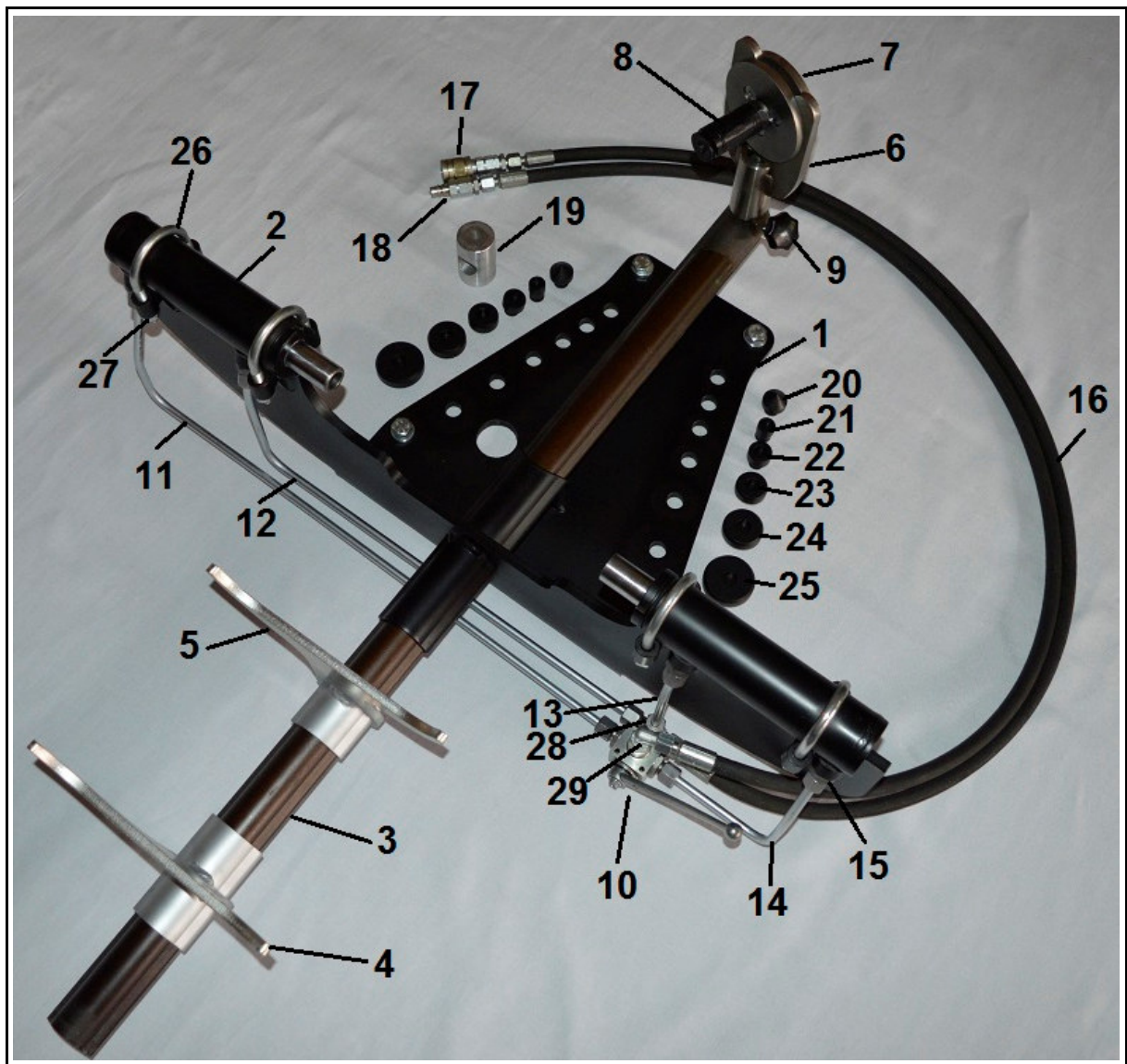


Fig. 101

Item	Drawing no.	Designation	Quantity
1	SW45-001	Base frame	1
2	SW45-002	Cylinder	2
3	SW45-003	Profile tube	1
4	SW45-004	Rack 150	1
5	SW45-005	Rack 120	1
6	SW45-006	Fixture	1
7	SW45-007	Locating washer	1
8	SW45-008	Spreader	1
9	SW45-009	Star knob screw	1

SPARE PART LIST

Item	Drawing no.	Designation	Quantity
10	SW45-010	Three-way valve	1
111	SW45-011	Hydraulic tube, ass.	1
12	SW45-012	Hydraulic tube, ass.	1
13	SW45-013	Hydraulic tube, ass.	1
14	SW45-014	Hydraulic tube, ass.	1
15	SW45-015	Screw fitting	4
16	SW45-016	Hydraulic hose	2
17	SW45-017	Coupler	1
18	SW45-018	Plug	1
19	SW45-019	Counter bearing	1
20 - 25	SW45-020-025	Mandrel set	2
26	SW45-026	U-bolt	4
27	SW45-027	Nut M10	8
28	SW45-028	T-piece 8L	1
29	SW45-029	Angle 8L	1
30	SW44/SW45-030	Decal sticker set	1

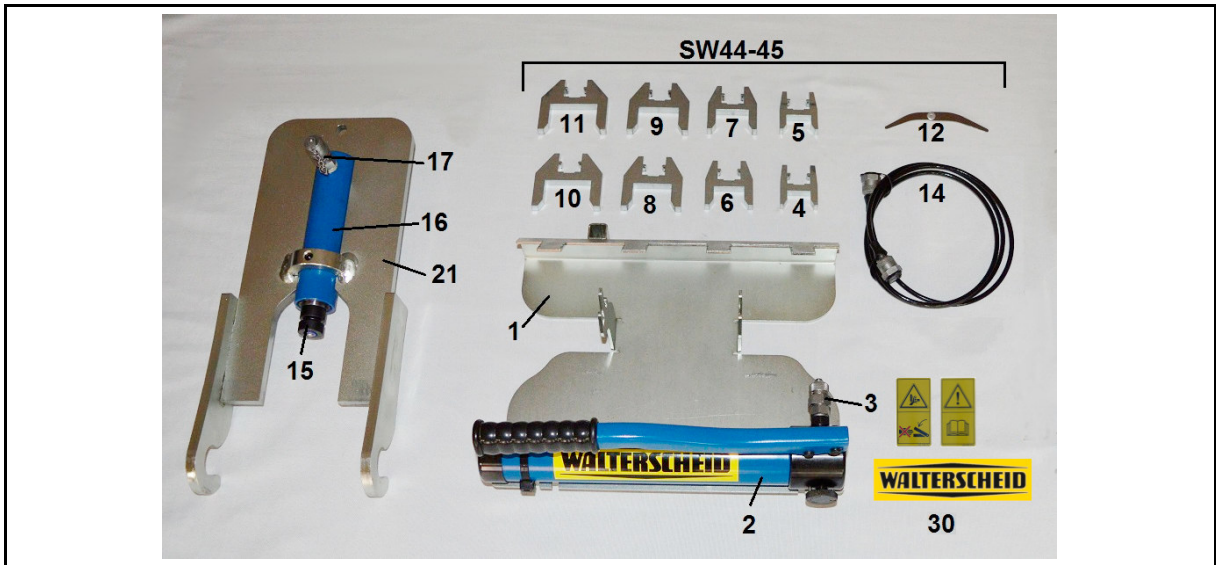


Fig. 102

Item	Drawing no.	Designation	Quantity
1	SW44-001	Rack	1
2	SW44-002	Hand pump	1
3	SW44-003	Screw connection 16x2P	1
4 - 11	SW44-004-011	Pusher set	1
12	SW44-012	Supplement 1010	1
14	SW44-014	Pressure hose	1
15	SW44-015	Set fixture	1
16	SW44-016	Cylinder	1
17	SW44-017	Screw connection 16x2Z	1
20	SW44-020	Tommy screw	2
21	SW45-022	Holder SW45	1
30	SW44/SW45-030	Decal sticker set	1

