

# KÄRCHER

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## **EASY!Force trigger gun, rotary knob, spray lance, PowerControl spray lance Service Manual**



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## Preface

Good service work requires extensive and practice-oriented training as well as well-structured training materials. Hence we offer regular basic and advanced training programmes covering the entire product range for all service engineers.

In addition to this, we also prepare service manuals for important appliances - these can be initially used as instruction guides and later on as reference guides.

Apart from this, we also regular information about product enhancements and their servicing.

If you should require supplements, have corrections or questions regarding this document, please address these citing the following subject to:

*international-service@de.kaercher.com*

Subject: **Fall 123094**

The responsible product specialist will take care of your issue.

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## Safety instructions

Service and maintenance tasks may only be performed by qualified and specially trained specialists.

**Observe safety information in the chapters!**

### **⚠ DANGER**

*Prior to all work on the appliance, switch off the appliance and pull the power plug.*

### **⚠ CAUTION**

*Risk of damage by electrostatic discharge (ESD)! Take suitable measures for discharging electrostatic charge prior to performing work on the appliance electronics.*

### **⚠ DANGER**

*Risk of injury! When adjusting the pressure/quantity regulation, make sure that the screw connection of the spray lance does not become loose.*

### **⚠ DANGER**

*Risk of injury and scalding! Prior to dismantling the accessories (removing the nozzles etc.), depressurise the device and allow it to cool down (cold water mode).*

### **⚠ DANGER**

*Risk of injury!*

- *The lever of the hand spray gun must not be locked during the operation.*
- *The safety lever must not be jammed during the operation.*
- *Hold the hand spray gun and the spray pipe firmly with both hands.*
- ➔ **Check the interfaces to ensure that they are seated firmly and are leak-proof.**
- ➔ **Secure the trigger gun with the locking slide when work is interrupted (long pauses, removing the nozzles, etc.).**

## Hazard levels

### **⚠ DANGER**

*For an immediate danger which can lead to severe injuries or death.*

### **⚠ WARNING**

*For a possibly dangerous situation which could lead to severe injuries or death.*

### **⚠ CAUTION**

*For a possibly dangerous situation which can lead to minor injuries or property damage.*

### **ATTENTION**

*Pointer to a possibly dangerous situation, which can lead to property damage.*

### **Note**

Indicates useful tips and important information.

## Description in this service manual

### Service groups

**Example:**

Install/uninstall ANRA wheel axle

AN	RA	Install/uninstall wheel axle
Service group	Component	Activity

### Functional group structure

010	Safety instructions
020	Overview
030	Function
040	Service activities
050	Maintenance and inspection
060	Error diagnosis
070	Peculiarities/ others
080 - 100	Not assigned

### Textual description

→ Instruction

■ Preparatory operations

1

2 Key numerical

A

B Key alphanumerical

– Enumeration / General list

⚠ **Safety note**

Pointer to hazards, sources of errors.

### Technical Features

– Trapezoidal thread (EASY!Lock) - fast thread - opening/closing with one turn.

**Note**

This is a special thread. No tool available for recutting the thread.

– New accessories in a grey colour, old accessories are black.

– TR22 thread replaces the previous M22x1.5.

– TR20 thread replaces the previous M18x1.5.

– Adapter concept for connecting the new and old accessories is available.

– Hot water and cold water guns

– Adjustable pressure and water quantity

– Easier operation of the trigger

### Gun (EASY!Force)

– A clearance setting is required after the node piece, handle bowls, locking slide or trigger have been replaced.

– Repair is an option, because the node piece and various spare parts are available.

– TR EH 60 gun - series for high-pressure devices, not available as a spare part.

– Trapezoidal thread

– EASY!Hold

– max. temperature 60 °C

– max. 300 bar

– Sealing material: valve seat and valve ball made of steel.

– Yellow trigger.

– EASY!Force gun - series for high-pressure hose devices.

– Trapezoidal thread

– EASY!Hold

– max. temperature 155 °C

– max. 300 bar

– Sealing material: valve seat and valve ball made of ceramic.

– Yellow trigger with black soft-grip.

## Rotating regulator

- Designed for three different flow volumes.
- Sealing for the gun using a yellow, Teflon-coated quad ring.
- Ceramic sealing discs were taken from previous designs.

## Ray tube

- Sealing for the gun or rotary knob using a yellow, Teflon-coated quad ring.
- Rotatable design in various lengths.
- New type of nozzle attachment and mounting for accessories.
- Additional handle as an option.

## PowerControl spray lance

- Sealing for the gun using a yellow, Teflon-coated quad ring.
- Spray lance with integrated rotary knob.
- Additional handle as an option.
- The quantity of water remains the same when adjusting the pressure.
- Detergent suction at the lowest pressure stage.

## HP hose

- Rotatable connection in some versions. Recognisable by the yellow kink protection.
- Sealing using black O-rings 10x2mm.

## Intended use

- Cleaning of: Machines, Vehicles, Structures, Tools, Facades, Terraces, Gardening tools, etc.
- Never leave the appliance unattended as long as it is in operation.

### **Danger**

*Risk of injury! Follow the respective safety regulations when operating at gas stations or other dangerous areas.*

## Field of application

This service manual describes the appliance family:

- EASY!Force trigger gun
- Rotating regulator
- Spray lance
- PowerControl spray lance

## Safety installations

Safety devices serve to protect the user and must not be rendered in operational or their functions bypassed.

**Observe safety information in the chapters!**

## Lock trigger gun

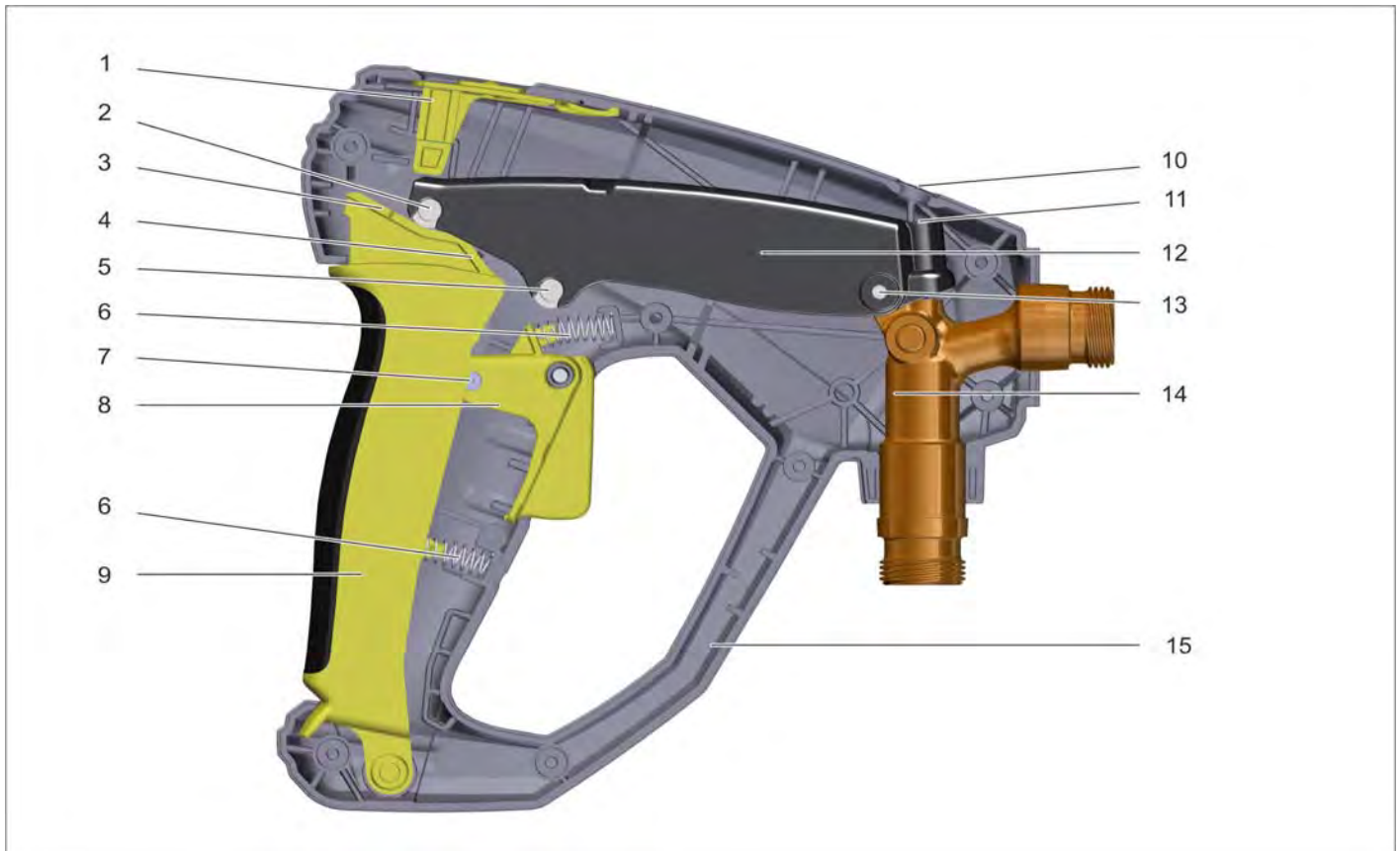
The slide blocks the lever for the trigger gun. This prevents the high-pressure jet from accidentally discharging and the device from starting.

## Safety lever

The safety lever locks the trigger gun when it is closed and must be actuated each time it is opened.

# Overview of the appliance

## Hand spraygun



1 Locking slide

2 Roller 1

3 Rolling surface for opening pressure

4 Rolling surface for operating pressure

5 Roller 2

6 Spring

7 Roller 3

8 Safety lever

9 Trigger

10 Stopper

11 Adjustment screw for trigger clearance

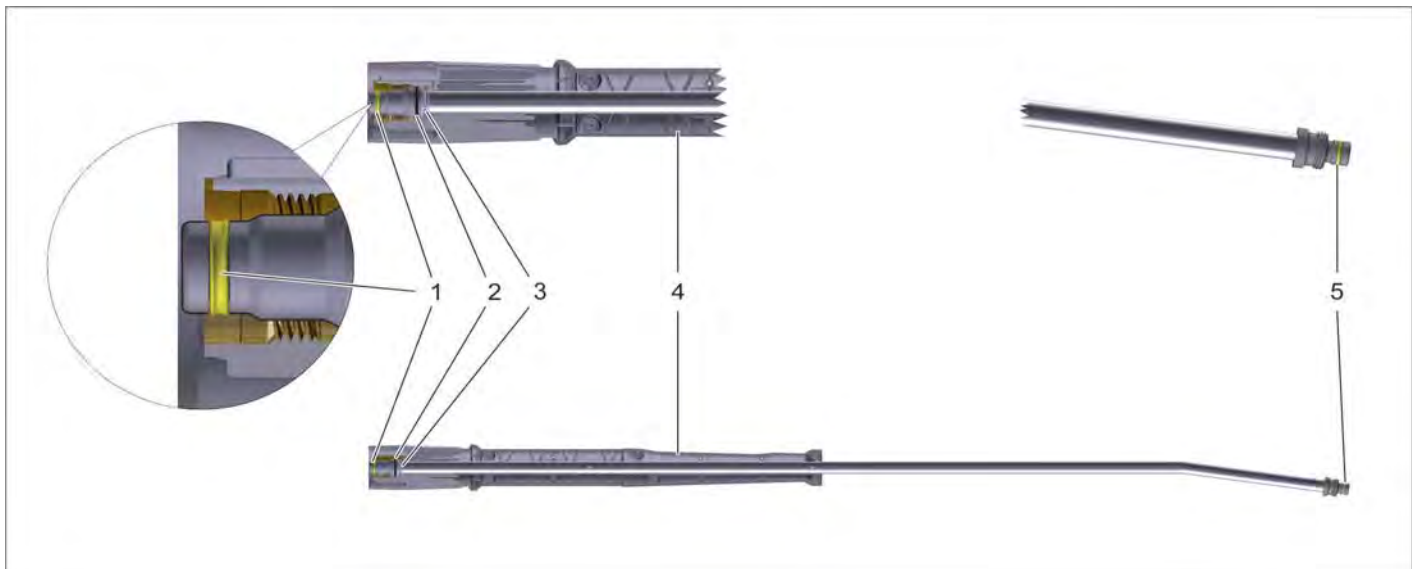
12 Lever

13 Cylinder pin

14 Node piece

15 Casing

## Ray tube



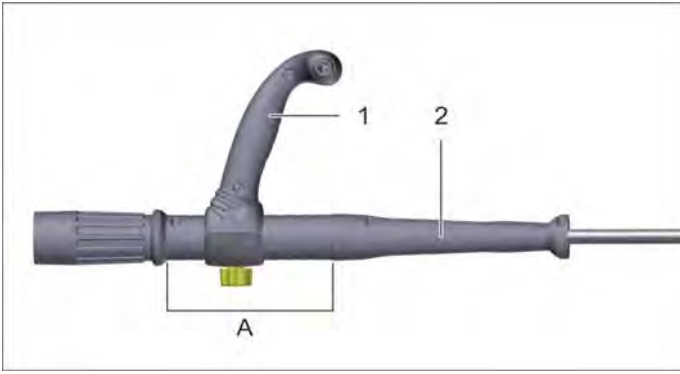
1 Quad ring  
yellow

2 O-ring for dust protection

3 Ball bearing

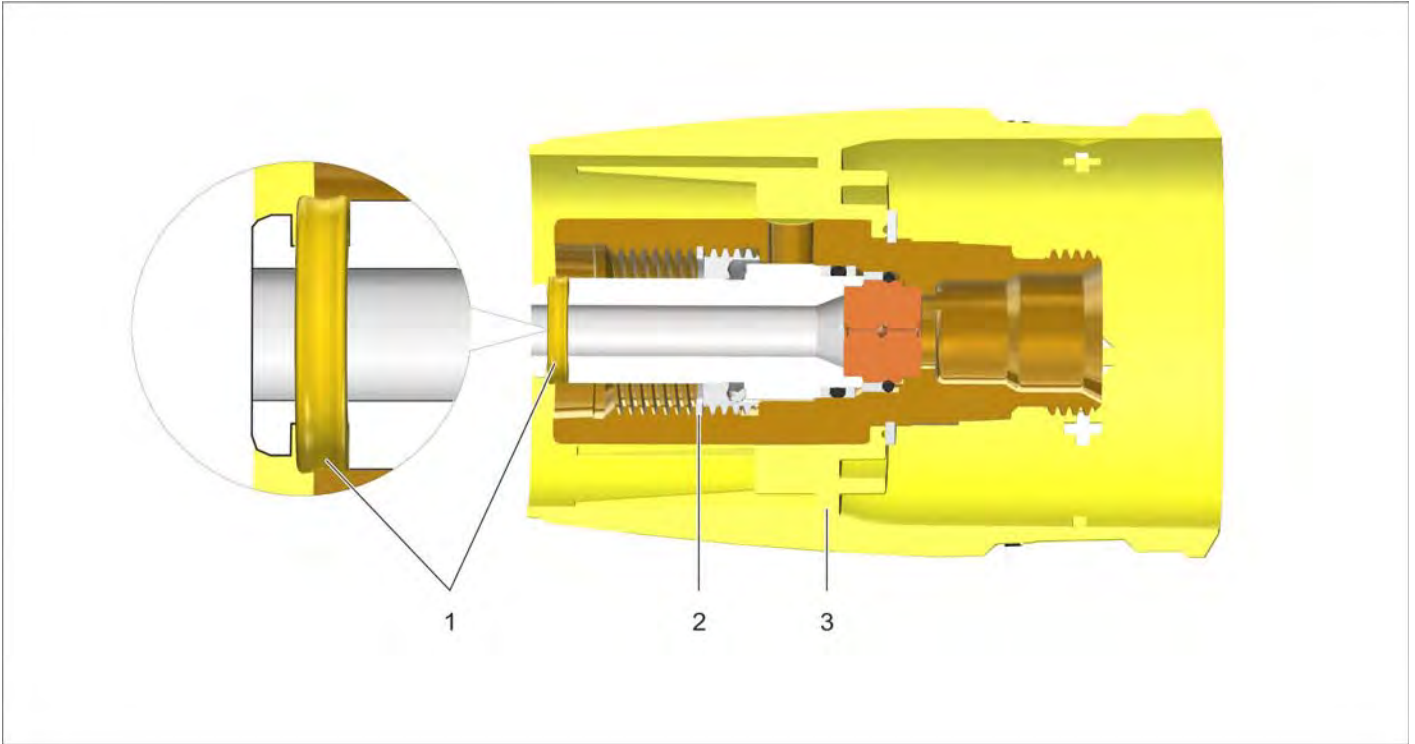
4 Casing

5 O ring  
yellow



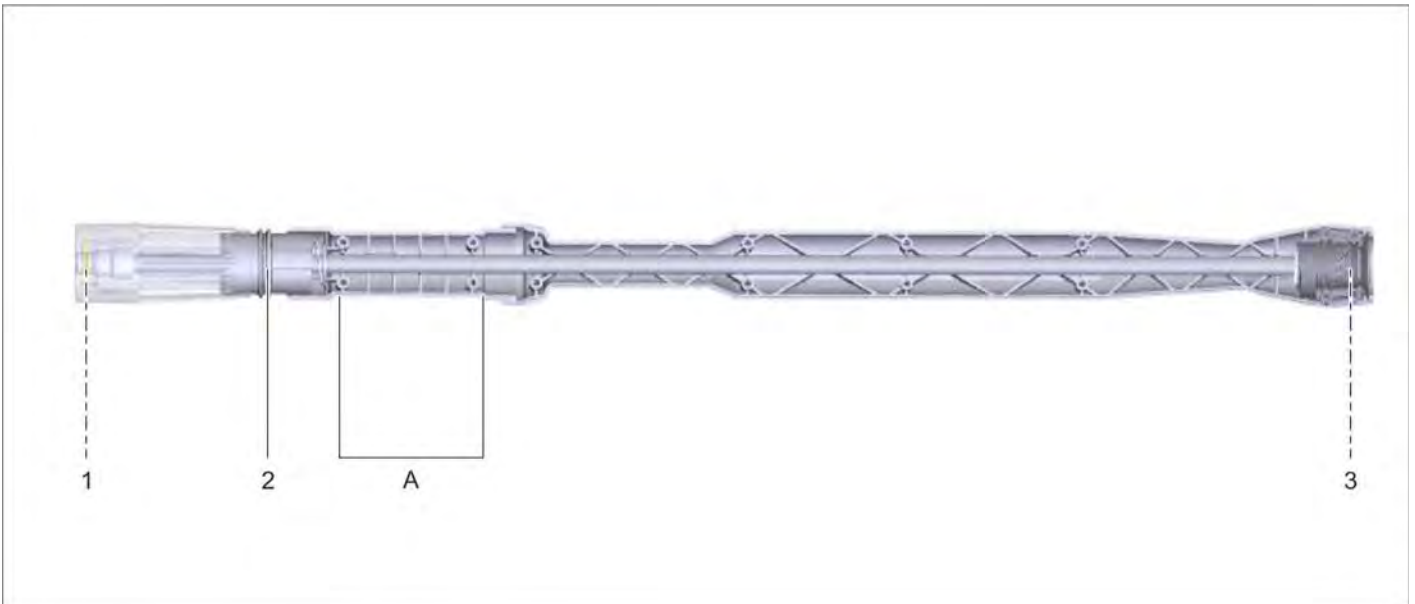
- 1 Optional handle
- 2 Spray lance
- A Mounting area

**Rotating regulator**



- 1 Quad ring
- 2 Safety ring
- 3 Casing

**PowerControl spray lance**



- 1 Quad ring yellow
- 2 Spray direction adjuster
- 3 Combi-nozzle
- A Handle mounting area

## AB Service group setup

### 010 Safety information

#### **⚠ WARNING**

Disconnect the gun from the connection hose prior to starting work.

Observe general safety information!

### 020 Overview

#### Hand spraygun



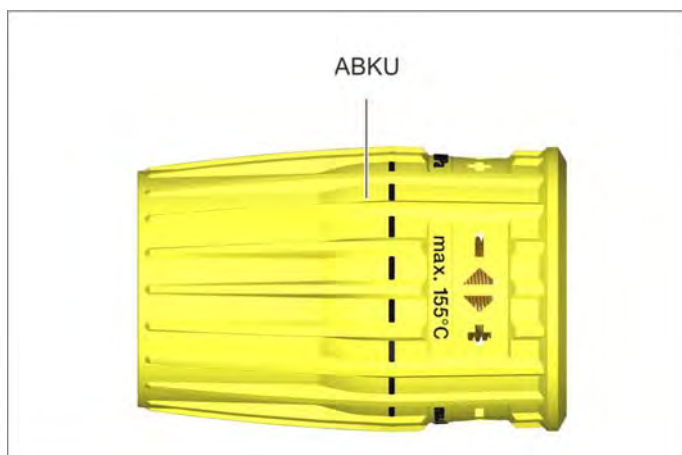
*ABKS Uninstalling / installing the node piece*

#### Ray tube



*ABKT Uninstalling / installing the ball bearing spray lance*

#### Rotating regulator



*ABKU Uninstalling / installing casing rotary knob*



## PowerControl spray lance



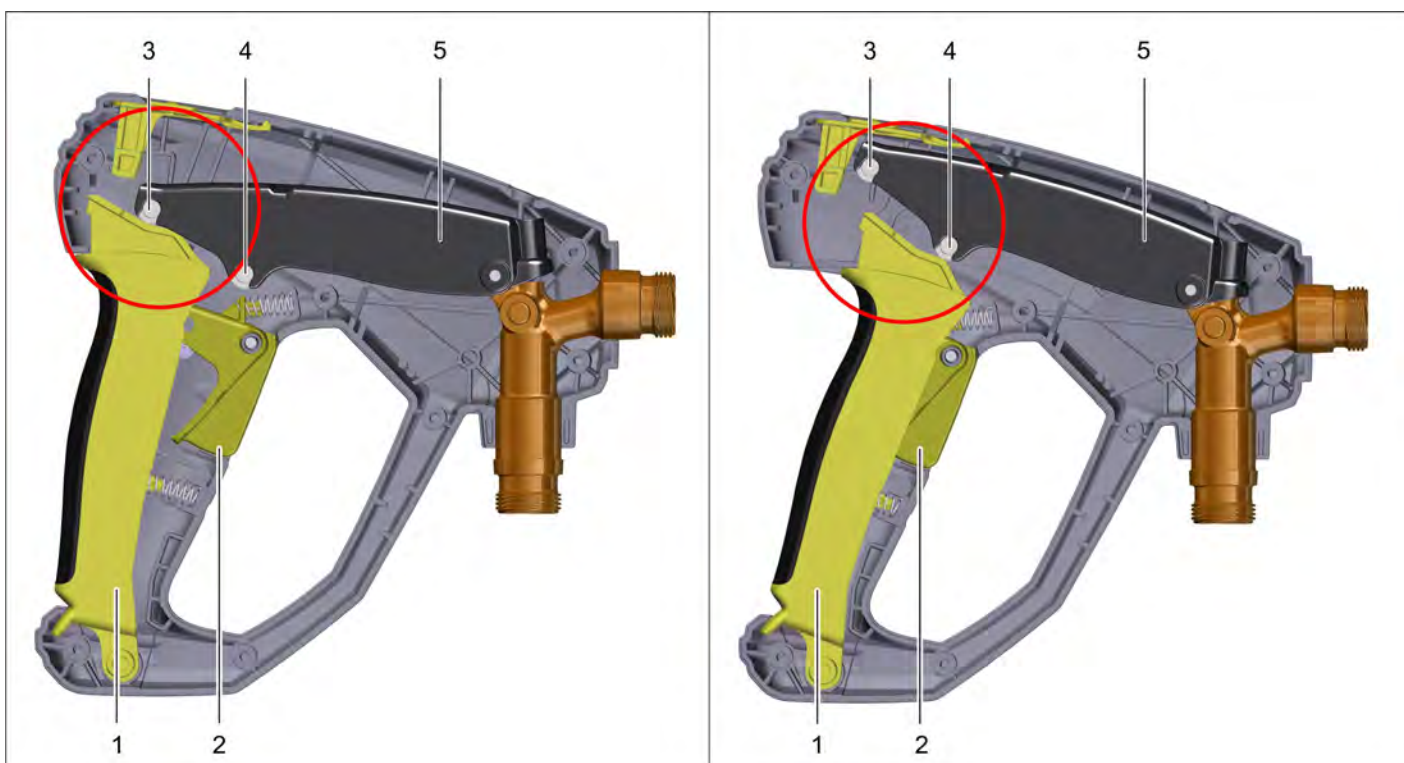
ABPA Removing/installing the combi-nozzle  
 ABPB Removing/installing the spray direction adjuster

## 030 Function

### Hand spraygun

Initial position, gun closed  
 Safety lever actuated

End position, gun opened  
 Safety lever and trigger actuated.



- 1 Trigger
- 2 Safety lever
- 3 Roller 1

- 4 Roller 2
- 5 Lever

When the manual lever is actuated, the valve in the node piece opens and the water can flow from the hose through the gun into the spray lance.

The gun is opened in three steps using the two surfaces on the trigger varying in steepness and the two rollers in the lever.

#### Level 1

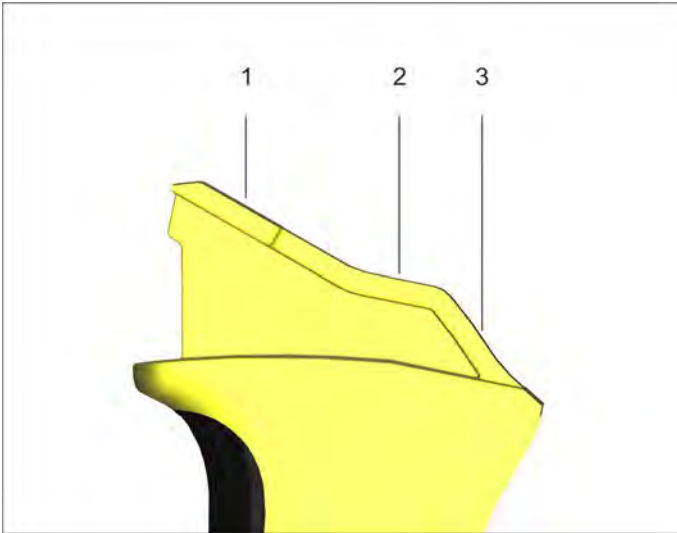
The actuated trigger lifts roller 1 slowly, and the valve opens.

#### Level 2

The steep surface on the trigger opens the valve completely using roller 2.

#### Level 3

Roller 2 stops on the flattened surface on the trigger and transfers a reduced holding force together with the thrust of the high-pressure jet.



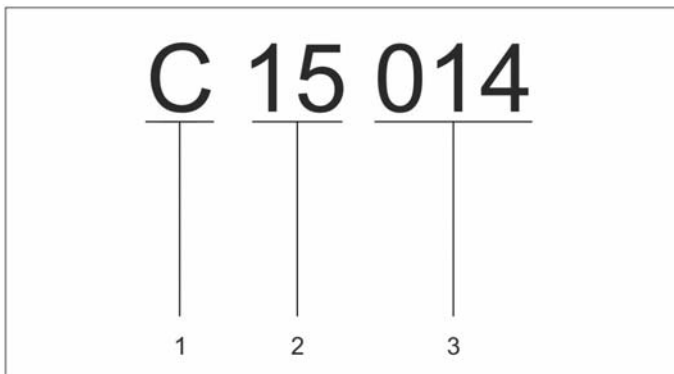
1	Surface 1	Roller 1 opens the flow partially
2	Surface 2	End position of roller 2 and holding position
3	Surface 3	Roller 2 opens the flow completely

**Note**

The node piece cannot be repaired and must be replaced as a complete unit.

The date of manufacture is imprinted on the node piece. It is composed of the month (letters A to L for January through to December), the year (two-digit number, 15 for 2015) and a three-digit number (material number, 014 = 4.775-014.0).

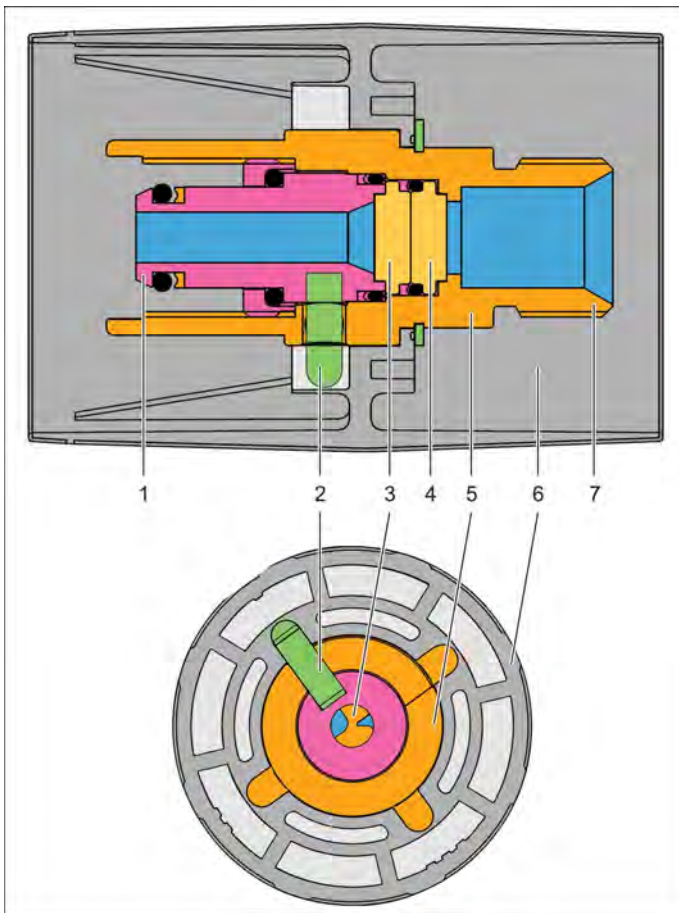
**Example:**



1	C	Month of manufacture	March
2	15	Year of manufacture	2015
3	014	Material number	4.775-014.0

The imprint can be found above the thread on the high-pressure input.

## Pressure and volume regulation



- 1 Connection trigger gun
- 2 Connecting pin
- 3 Ceramic disc on gun side
- 4 Ceramic disc on spray pipe side
- 5 Casing of rotating regulator
- 6 Handle of rotary regulator
- 7 Spray lance connection

The pressure and volume regulation is designed as a rotary regulator between the trigger gun and the spray lance. There are two ceramic discs within the high pressure channel.

A ceramic disc is rigidly connected with the connection of the trigger gun. The other ceramic disc is connected to the rotating regulator and therefore adjustable. Offset holes in the ceramic discs can adjust the flow volume and the pressure when rotating the discs.

This illustration shows the two overlapping ceramic discs and the water flow (blue) with different opening angles (from 0° to 90°).

With the minimal setting, the water flows through a small hose in the middle of the ceramic discs.

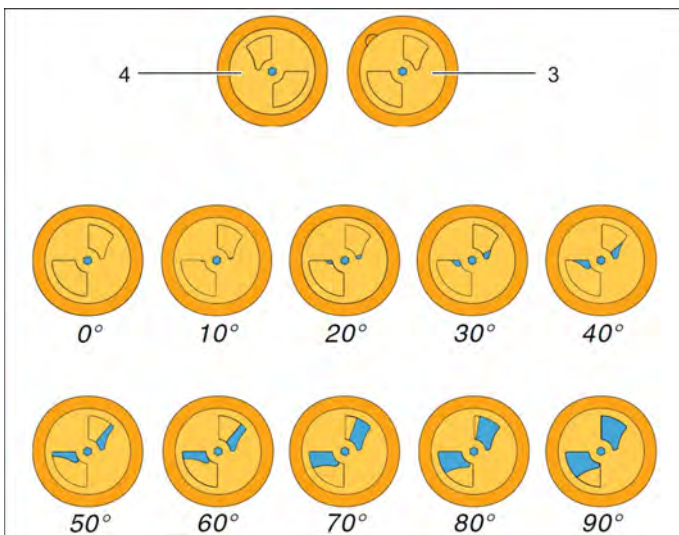
### Note

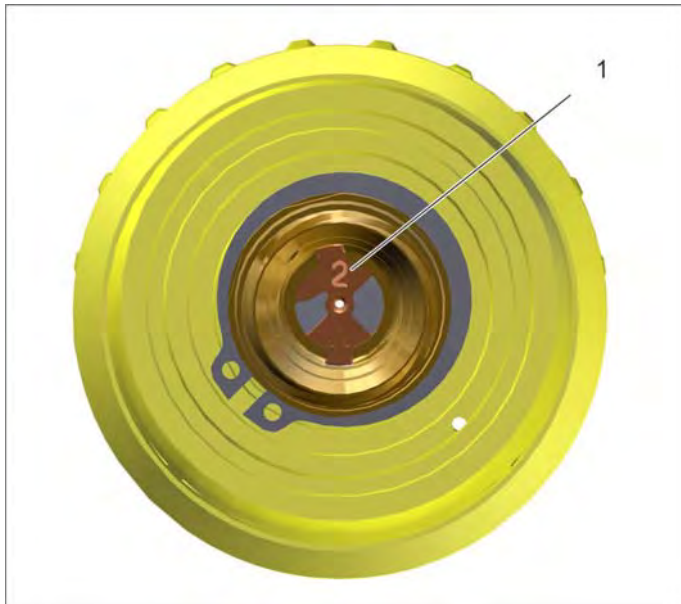
The rotary regulator cannot be repaired and must be replaced as a complete unit.

### Note

The illustration shows the earlier version of the rotary knob and is used for clarification only

## Water flow with opening angle 0° - 90°





## 1 Code

The various rotary knobs can be distinguished by the code.

Code	Material number	Litre
1	4.118-007.0	< 750 l/h
2	4.118-008.0	750 - 1100 l/h
3	4.118-009.0	> 1100 l/h

### Installation of rotary knob on spray lance

#### Note

The thread must be clean and free of grease.

- ➔ Apply a thin layer of metal glue to the middle of the thread.
- ➔ Screw the rotary regulator in resting position manually onto the gun.
- ➔ Tighten the rotary knob.

Torques	Nm
Rotating regulator	20

#### Note

The glue connection is handtight after 12 minutes and hardened after 12 hours.

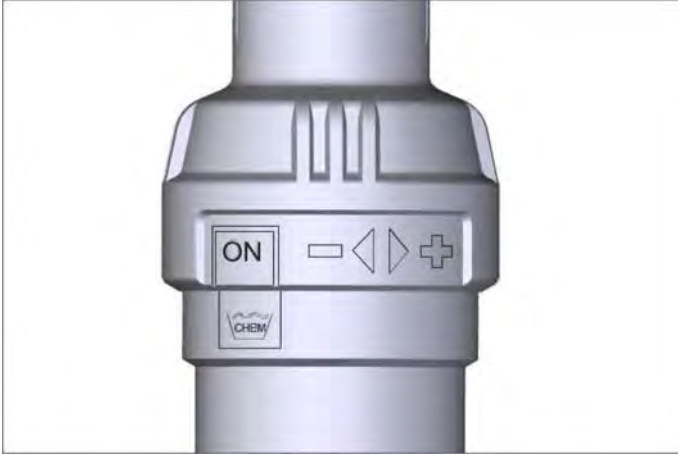
Metal glue	6.869-075.0
------------	-------------

## PowerControl spray lance

Material number	Nozzle
4.112-043.0	25027
4.112-045.0	25034
4.112-047.0	25038
4.112-046.0	25042

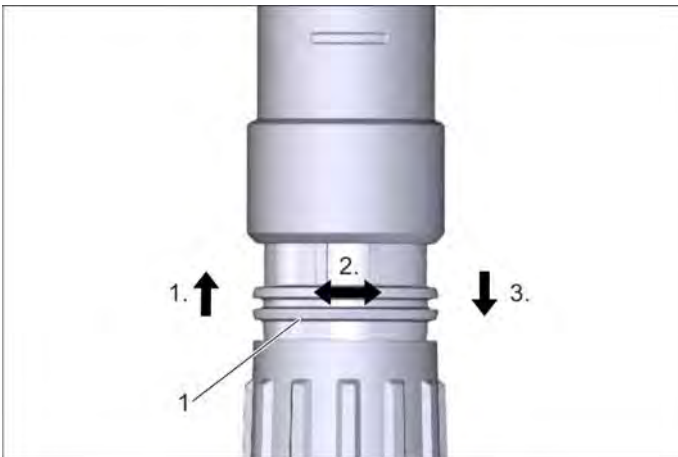
- The PowerControl spray lances are delivered with different nozzles.
- The nozzle size is labelled on the front of the nozzle.

## Detergent intake



To activate the detergent suction, the pressure adjustment must be set to the lowest pressure.

## Spray direction



### 1 Adjuster

The spray direction can be changed with the adjuster.

## 040 Service activities

### ABKS Uninstalling / installing the node piece

#### Note

The node piece cannot be repaired and must be replaced as a complete unit.

- 1 Screws Torx 15
- 2 Casing half bowl
- 3 Stopper

- Unscrew the screws.
- Remove the plug.
- Remove the casing half bowl.



- 1 Node piece with lever

- Remove the node piece with lever.

#### Note

Mind the installation position.

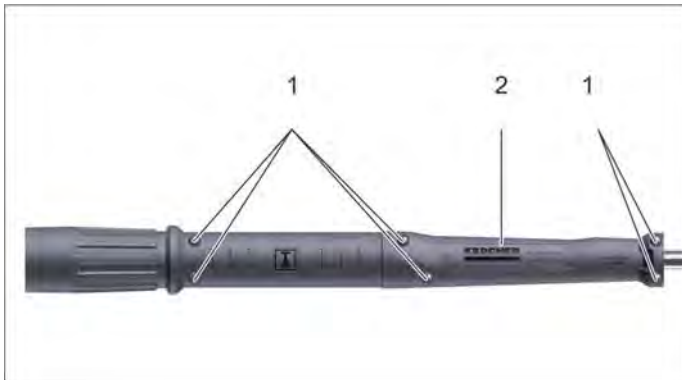




## ABKT Uninstalling / installing the ball bearing spray lance

### Note

Only valid for TR spray lance

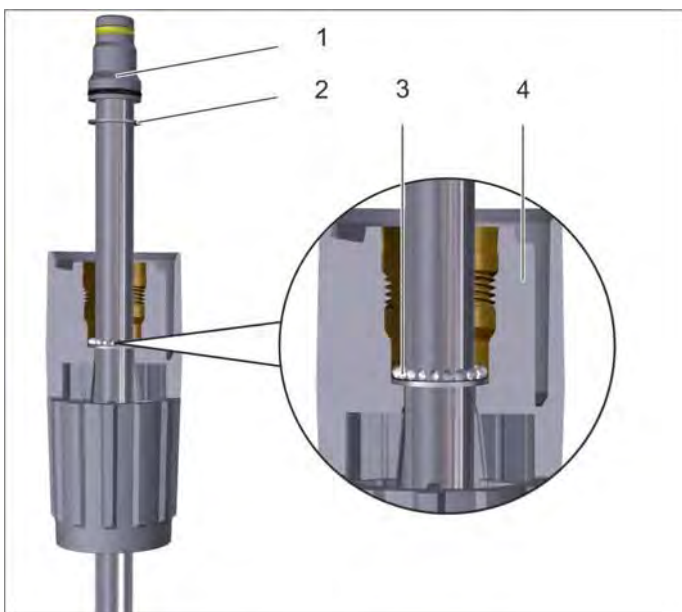


1 Screws

2 Casing

→ Unscrew the screws.

→ Remove the housing.



1 Nozzle

2 Disc

3 Balls

4 Sleeve

### Note

Hold the spray lance in a vertical position so that the balls do not fall out of the sleeve.

→ Slide the sleeve down.

→ Take the disc out of the sleeve.

→ Tip the balls out of the sleeve.

### Installation information

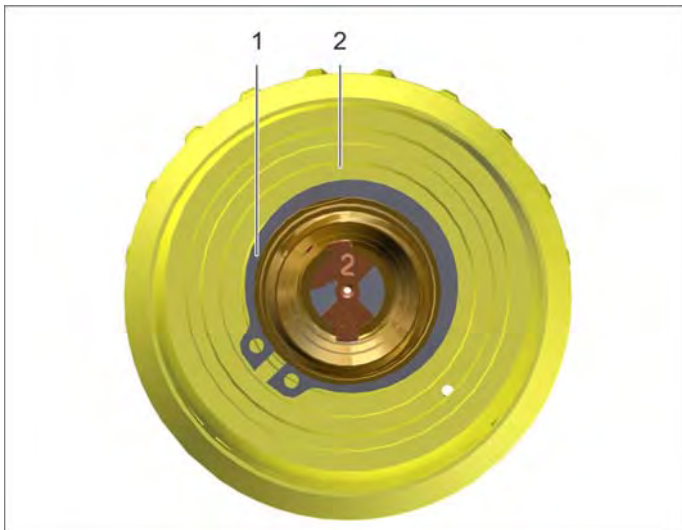
Mind the installation position.

Check components for wear / damage.

## ABKU Uninstalling / installing casing rotary knob

### Note

Only valid for TR spray lance



1 Safety ring

2 Casing

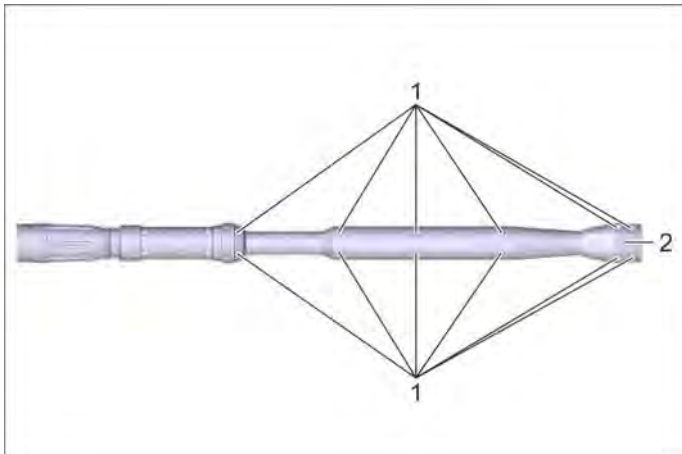
→ Remove the locking ring.

→ Remove casing.

## ABPA Removing/installing the combi-nozzle

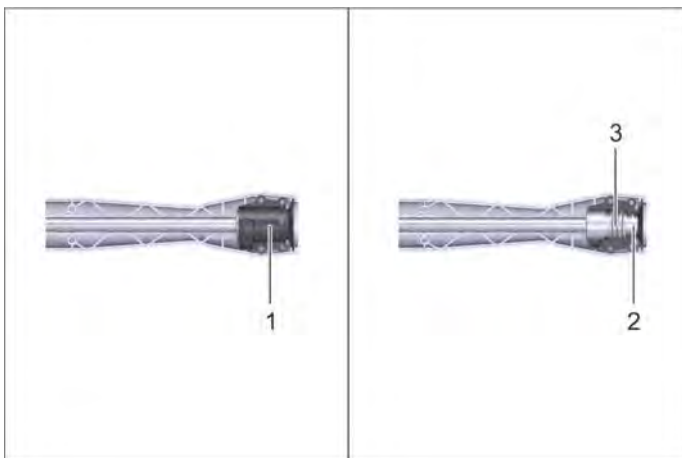
### Note

Only valid for PowerControl spray lance.



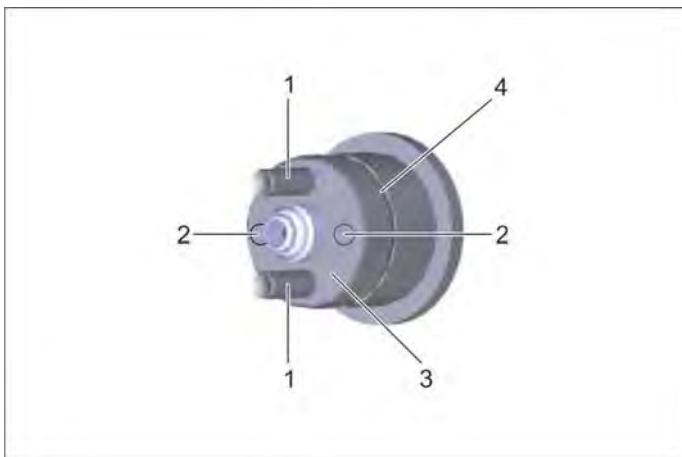
- 1 Screws
- 2 Casing shell

- Unscrew the screws.
- Take off the casing part.



- 1 Cup head
- 2 Combi-nozzle
- 3 Nozzle holder

- Take off the cup head.
- Take combi-nozzle out of the nozzle intake.



- 1 Pins
- 2 Through-holes
- 3 Combi-nozzle
- 4 O ring

- Take nozzle out of the casing.

### Installation information

Grease the O-ring with silicone grease.

Ensure that the pins are in the correct installation position.

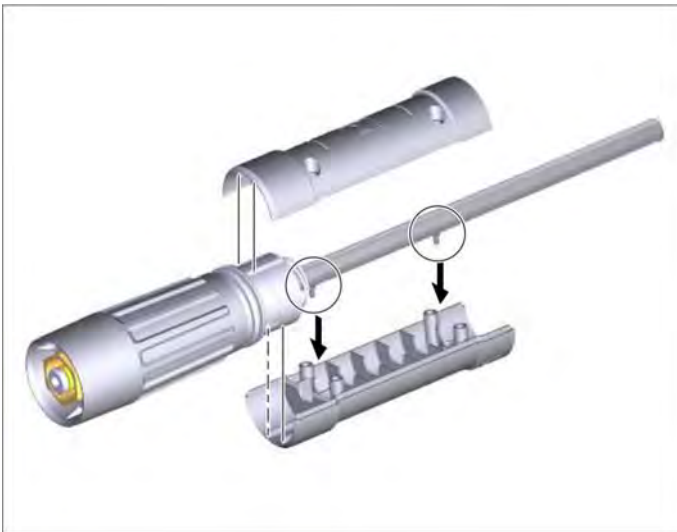
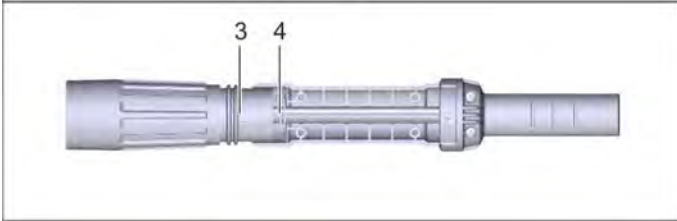
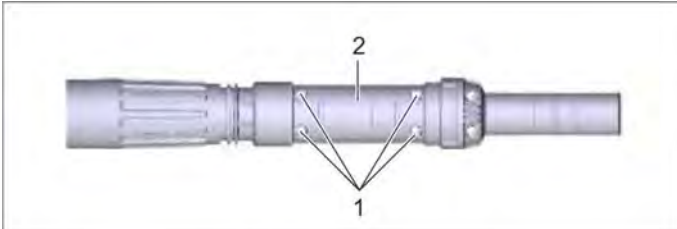
Pins cannot be mounted in the through-holes of the combi-nozzle.



## ABPB Removing/installing the spray direction adjuster

### Note

Only valid for PowerControl spray lance.



- 1 Screws
- 2 Casing shell
- 3 Adjuster
- 4 Spring

- Unscrew the screws.
- Take off the casing part.
- Remove the adjuster with the spring.

### Installation information

Observe installation position.

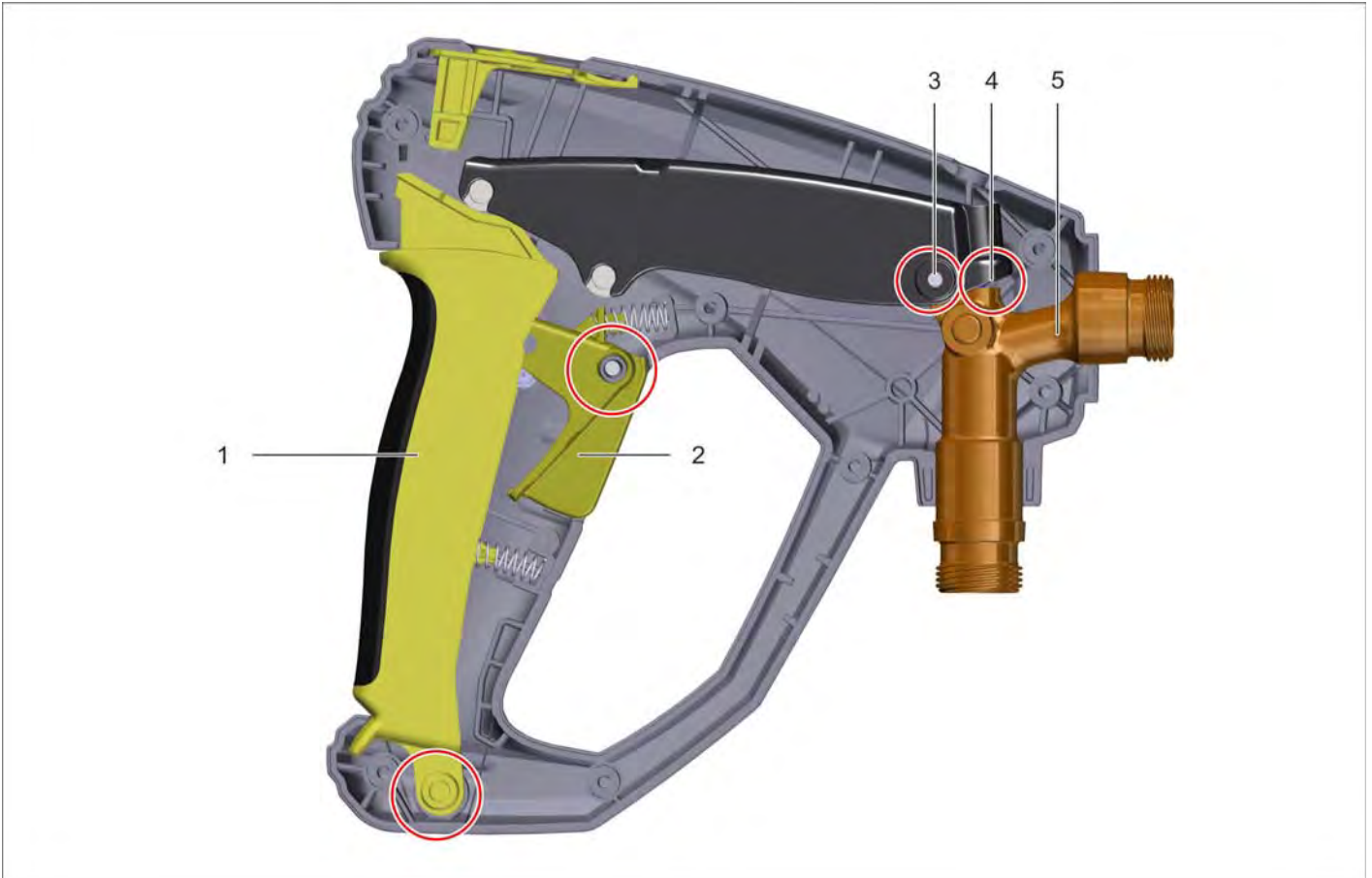
### Installation:

Make sure the spring is in the correct installation position. Insert the bolts of the spray lance into the specified holes in the handle bowl.

The lugs on the casing parts must engage into the guides of the adjuster.

## 050 Maintenance and inspection

### Overview lubricating points



- 1 Trigger
- 2 Safety lever
- 3 Axle
- 4 Pin
- 5 Node piece

#### Note

Lubricate the marked surfaces.

Only required after replacing parts or if the gun has been opened for checking.

Grease	Material number
Silicon grease	6.288-044.0

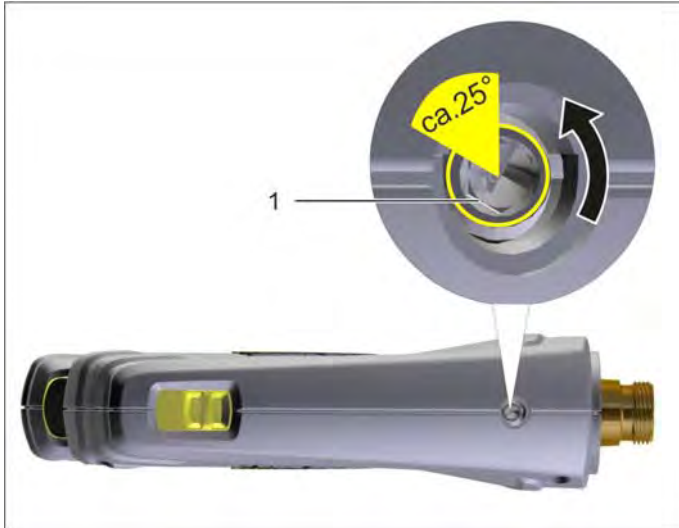
## Setting the trigger clearance

### Note

After replacing the complete node piece, handle bowls, lever, safety slider or trigger, the clearance for the trigger needs to be reset.

Prior to the adjustment, assemble the complete gun and connect it to the water pressure.

## Setting under pressure



- 1 Adjusting screw      Hexagon socket 4mm

### Note

See "Trigger gun" description.

- Secure the gun using the locking slide (slide forward).
- Actuate the safety lever and trigger and use your hand to apply firm pressure.
- Screw in the adjustment screw until you can see a leak.
- Unscrew the adjustment screw (approx. 25°) until the gun is sealed.
- Relieve pressure on all levers.

### Crosscheck:

- Unlock the locking slide (slide back).
- Actuate the trigger (without the safety lever) with the palm of your hand.

### Note

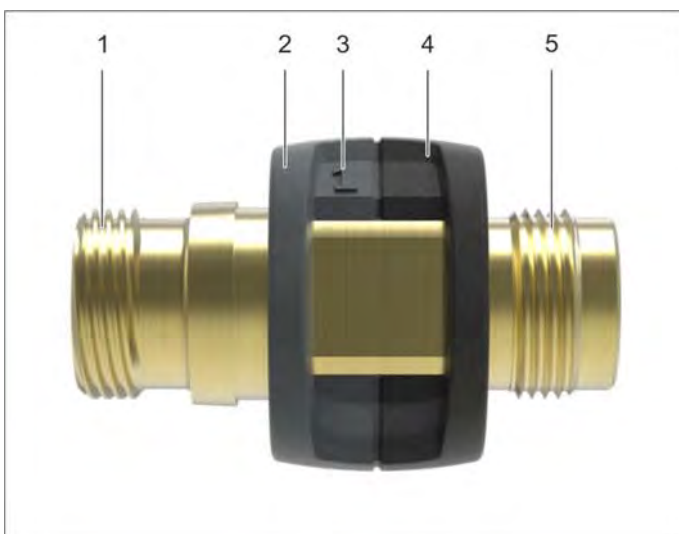
The gun must not leak.

## 060 Error diagnosis

Findings	Possible cause	Correction
Gun is leaking	Lever clearance not set or incorrectly set	Set the lever clearance
Gun is leaking	Valve ball or valve seat contaminated/worn	Replace the node piece

## 070 Peculiarities/ others

### Adapter concept for connecting the new and old accessories



- 1 EASY!Lock - thread
- 2 Anthracite: New EASY!Lock
- 3 Adapter number
- 4 Black: old M22 x 1.5
- 5 M22 x 1.5

More information on the adapter concept:

[www.kaercher.com/adapterfinder-easylock](http://www.kaercher.com/adapterfinder-easylock)

Adapter number	new	Adapter	old
1			
	EASY!Lock	4.111-029.0	M22 x 1.5
2			
	EASY!Lock	4.111-030.0	M22 x 1.5
3			
	EASY!Lock	4.111-031.0	M22 x 1.5
4			
	EASY!Lock	4.111-032.0	AVS
5			
	EASY!Lock	4.111-033.0	M22 x 1.5
6			
	EASY!Lock	4.111-034.0	M22 x 1.5
7			
	EASY!Lock	4.111-035.0	M18 x 1.5
8			
	EASY!Lock	4.111-036.0	M18 x 1.5

**Note**  
The adapters are designed in two colours: black/anthracite. This makes classification easy: new (anthracite) and old (black).

## Technical Documentation

Appliance type	Appliance no.	Circuit diagram	Operating instructions	Spare parts list
EASY!Force gun	4.118-005.0	-	5.967-048.0	-
EASY!Force Food gun	4.118-015.0	-	5.967-048.0	-
EASY!Force Ex gun	4.118-020.0	-	5.967-048.0	-
TR spray lance 1050 mm	4.112-000.0	-	-	-
Rotary knob 1 (270 l)	4.118-007.0	-	-	-
Rotary knob 2 (416 l)	4.118-008.0	-	-	-
Rotary knob 3 (700 l)	4.118-009.0	-	-	-
PowerControl spray lance	4.112-043.0	-	-	-
PowerControl spray lance	4.112-045.0	-	-	-
PowerControl spray lance	4.112-047.0	-	-	-
PowerControl spray lance	4.112-046.0	-	-	-