

MAINTENANCE INSTRUCTIONS

GAS SPRINGS

2480.2X./3X.



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In the German language, this document is the original version in the EU language of the manufacturer and is labelled with the German national flag.

In the language of a country of use, this document is a translation of the original version and labelled with the national flag of the country of use.

This document is referred to as "instructions" in the following text.

Number of pages in this manual including the title page: 28

These instructions are valid for the product

2480.2x./3x.

Gas springs

2480.21.00050. - .00200.

2480.22.00050. - .00200.

2480.23.

2480.32.00050. - .00200.

This document was created by

FIBRO GMBH

August-Läpple-Weg

DE 74855 Hassmersheim

Phone: +49 (0) 62 66 73 0

Fax: +49 (0) 62 66 73 237

E-mail: info@fibro.de

Internet: www.fibro.de

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1 SAFETY

1.1 Safety information

The statements contained in this document only apply to the maintenance of the stated gas springs and are only for the use by trained and authorised staff.

Staff has to have the necessary training, experience and product knowledge as well as specialist tools in order to carry out maintenance work correctly.

Staff has to have fully read and understood this document prior to carrying out any maintenance work.

Replacement of spare parts without special training or knowledge of the maintenance instructions and without the specialist tools can be dangerous and may lead to accidents causing severe injuries or even death.

Most accidents during maintenance occur due to disregarding the basic safety regulation.

Noticing a potential danger can prevent accidents from happening. Safety information in this document warn about potential risks. FIBRO GMBH can not foresee all situations which may potentially cause risks. The warnings in this document are therefore not all encompassing.

If a work material, an act, a work method or work technique is used which has not been specifically suggested by FIBRO GMBH, then the user has to ensure the safety for himself and other persons.

The information, descriptions and illustrations in this documents are based on the information on the basis of information which was available at the point of creation of this document.

Illustrations show examples of a potential gas spring and are not to scale.

Descriptions, tightening torques, operating pressures, measuring methods, illustrations and other points are subject to change at any time. The changes can have an influence on the component's properties. Prior to starting any work, obtain the currently available information.

1.2 Safety instructions

These instructions contain safety notices intended to draw attention to possible dangers that should be observed to prevent injury.

The pertinent text describes

- the type of danger
- the source of danger
- the options for preventing injuries
- the consequences in case of non-observance of the warning notices

The safety instructions are emphasised by a colour signal bar with warning triangle and signal word.

The signal bars have the following meaning:



WARNING!

A safety notice on an orange signal bar with the signal word WARNING designates a hazard with a medium risk level which, if not avoided, might result in death or severe injury.

1.3 General instructions

In addition to the safety notices, these instructions contain information that must be observed to prevent property damage.

The pertinent text describes

- the possible reason for property damage
- the possibilities for preventing property damage

Notices of possible property damage are emphasised by a blue signal bar and the signal word **ATTENTION**.

NOTICE

Notices for the prevention of property damage are not related to possible injuries.



Furthermore, these instructions contain general information on use.

General information on use and tips for certain applications are emphasised with a blue information symbol.

1.4 Complimentary documents

For safe maintenance further, applicable documents are necessary. The information in these documents have to be adhered to.



Gas spring operating instructions



Safety data sheet "Exchange of spare parts"



Operating instructions filling and control fitting.

1.5 Residual risks



WARNING!

Filled gas springs are under high internal pressure.

Before repairing, drain the nitrogen completely.

- ▶ To drain, open the valve carefully and only slightly
- ▶ Wear safety glasses. Eye injuries due to nitrogen leaks
- ▶ After removing the locking screw, never bend directly over the valve. Never direct the fill opening towards persons
- ▶ Only unscrew the valve when there is no more nitrogen flowing out and the piston rod can be pushed in by hand. Injuries due to valve flying out.
- ▶ If assembled incorrectly, parts may be propelled out after filling. Observe the precise installation position of the spare parts. Never direct the piston rod towards persons. Injuries possible due to parts flying out.



WARNING!

Use of incorrect spare parts

Installing the incorrect spare parts results in a loss of safety.

- ▶ After filling with nitrogen, parts may be propelled out due to internal pressure.
- ▶ Before repair, always ensure that the correct set of spare parts is being used.
- ▶ Injuries possible due to parts flying parts.

NOTICE

Damages during repair

Always use protective jaws when clamping a gas spring into a vice. Ensure a clean environment.

- ▶ Grooves, bumps or other damages can cause leakages.
- ▶ Never exercise undue force to the gas spring during repair. Protect against damages.
- ▶ Let nitrogen flow in slowly during the filling process. The valve of the gas spring can be damaged.
- ▶ For the filling process, only use pure nitrogen N2 of Grade 5.0 purity or higher.

Highest permissible filling pressure: 180 bar (2610 psi).

2 MAINTENANCE

2.1 Inspection

2.1.1 Check gas pressure

NOTICE

Damage to the gas springs when using other tools

Use the tools given below for the test. The tools are available from FIBRO GMBH.

Tools:

Pos.	Description	Article number
[A]	Filling and checking equipment	2480.00.32.21
[B]	Filling hose	2480.00.31.02
	Cylinder pressure reducer (optional)	2480.00.32.07

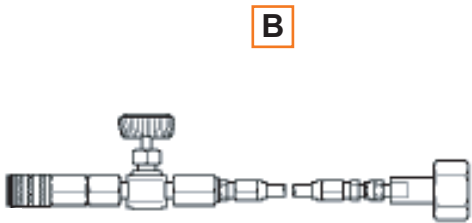


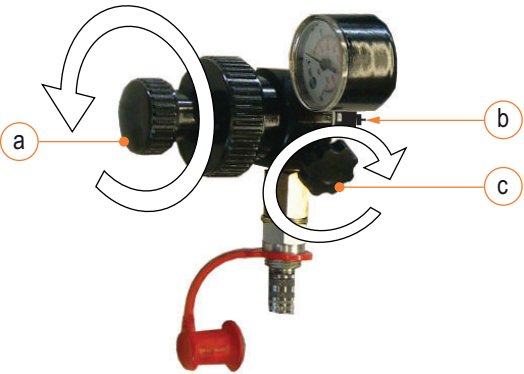
Fig. 2-1 Required tools



Observe the operating instructions for the filling and checking equipment 2480.00.32.21.

Filling and control fitting to be prepared

- Small turn knob (a) to be turned left until it arrests. This moves the tripping pin (b) into the retracted position.
- Outlet valve (c) to be connected.



Checking the gas pressure



If the gas springs are attached to the floor with a fill opening in the bottom of the cylinder tube, the fill opening is concealed. To check the gas pressure, the gas spring must be disassembled. These gas springs do not have a locking screw.

The spring type 2480.23. does not have a valve and can, therefore, only be connected in combination.

- 1) Only for gas springs with side fill opening:
Unscrew the locking screw above the fill opening of the gas spring using an Allen key.

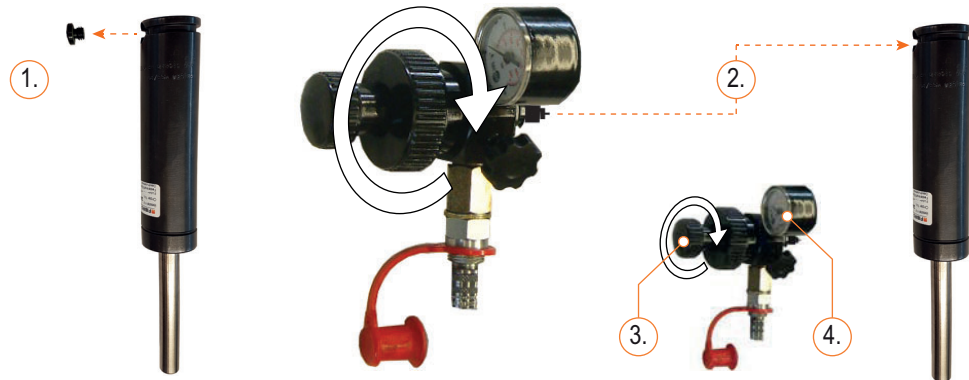


Fig. 2-2 Gas spring with side fill opening

- 2) Place the fill and control valve on the fill opening. Screw on by turning the large knob.
- 3) Turn the small knob inwards. The release pin opens the valve. Caution! Do not turn the release pin inwards too far. Otherwise the valve may be damaged.
- 4) Read the filling pressure on the manometer display.

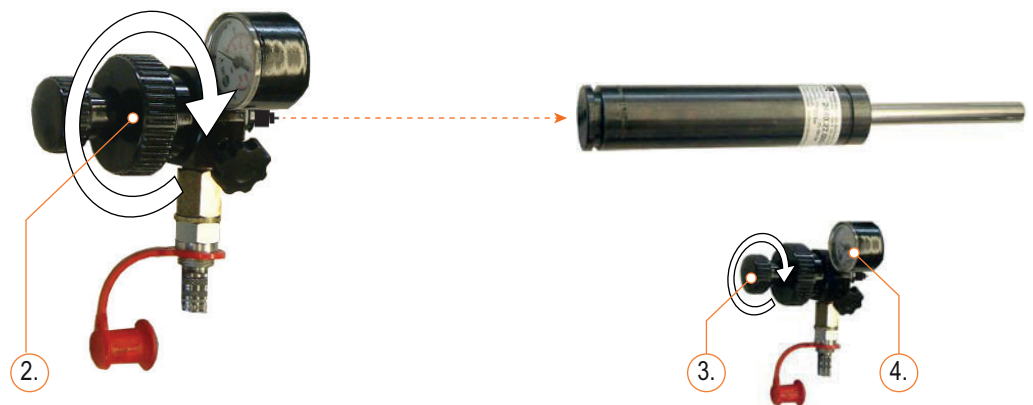


Fig. 2-3 Gas spring with fill opening in the base



The permissible filling pressure is printed on the gas spring. If the filling pressure is too low, the nitrogen must be topped up (see chapter 2.3 "Fill with nitrogen" on page 22).

- 5) After checking, turn the small knob clockwise. The release pin moves into the retracted position and closes the valve.
- 6) Turn the knob on the outlet valve and bleed the fitting.
- 7) Unscrew the fitting from the fill opening by turning the large knob.

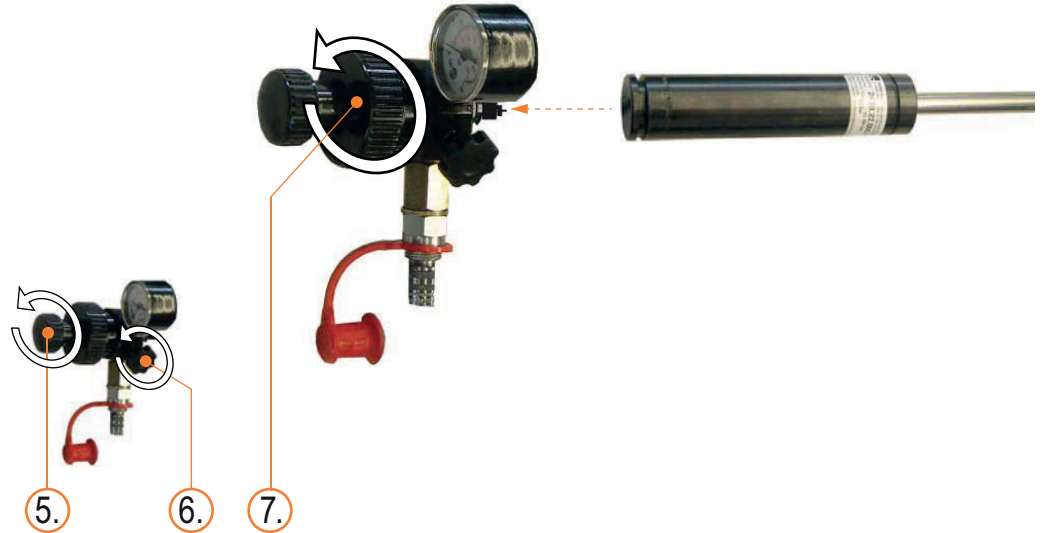


Fig. 2-4 Gas spring with fill opening in the base

- 8) Only for gas springs with side fill opening:
Screw the locking screw into the fill opening of the gas spring.
M6 locking screw tightening torque: 7 Nm (5 lb-ft).

2.2 Repairs

2.2.1 Components of the gas spring

(1)	Piston rod	(2)	Colour identification ring
(3)	Retaining ring	(4)	Label
(5)	Fitting set	(6)	Cylinder pipe
(7)	Special oil 35 ml (248.00.50)	(8)	Valve (not for spring type 2480.23.)
(9)	Locking screw Only for gas springs with side fill opening		

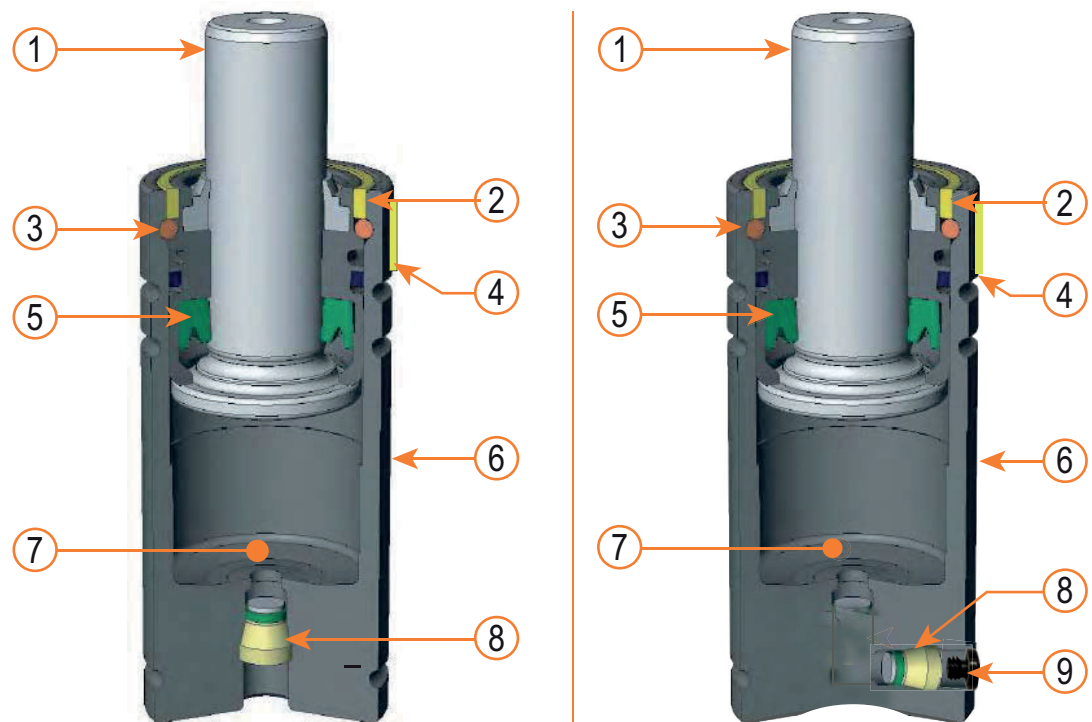


Fig. 2-5 Components of the gas spring



A gas spring with a white colour identification ring is filled in accordance with customer requirements.

2.2.2 Required spare parts, tools and tool kits

2.2.2.1 Spare parts

Gas spring spare parts set 2480.2x./3x.

The spare parts set comprises:

Valid for all types			bar	dN
1	Label*	green:	45	50
		blue:	90	100
		red:	135	150
		orange:	180	200
2	Colour identification rings*	green:	45	50
		blue:	90	100
		red:	135	150
		orange:	180	200
		black:	variable	--
3	Fitting set			
4	Retaining ring			
5	Valve (not for spring type 2480.23.)			
6	Locking screw (only for gas springs with side fill opening)			
7	Special oil 35 ml (248.00.50.)			

* The gas springs are suitable for operation with variable filling pressure. Select the label and colour identification ring depending on the filling pressure used.

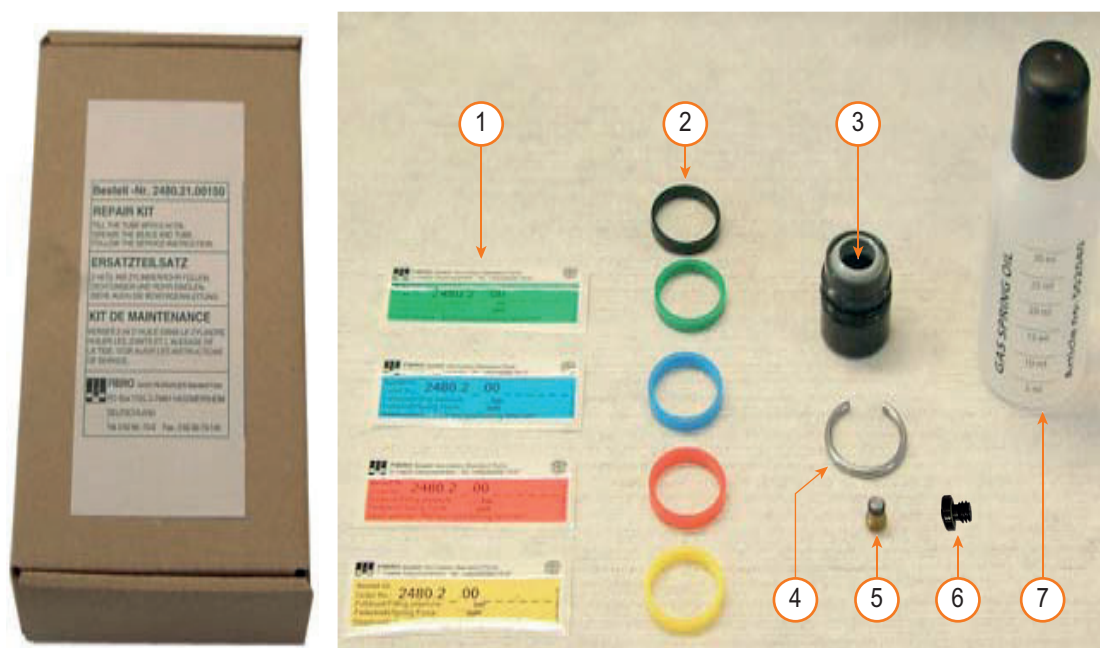


Fig. 2-6 Spare parts set gas spring 2480.2x./3x.

NOTICE

Damage to the gas pressure spring if other spare parts are used

Only use genuine spare parts from FIBRO GMBH.

All spare parts included in the spare parts kit must always be replaced completely.

2.2.2.2 Tools

Tools:

Pos.	Description	Article number
[A]	Filling and checking equipment	2480.00.32.21
[B]	Filling hose	2480.00.31.02
	Cylinder pressure reducer (optional)	2480.00.32.07

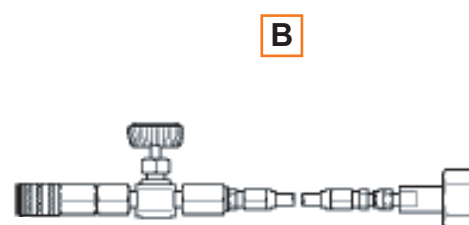


Fig. 2-7 Required tools



Observe the operating instructions for the filling and checking equipment 2480.00.32.21.

NOTICE

Damage to the gas pressure spring if other resources and tools are used.

Use the resources and special tools listed for repairs. The resources and tools can be obtained from FIBRO GMBH.

2.2.2.3 Tools

Tool set

Pos.	Description		
(1)	Disassembly handle M3	(2)	Circlip tongs
(3)	Mounting sleeve Mini	(4)	Valve tongs M6



①



②



③



④

Fig. 2-8 Required tools

2.2.3 Replacement of spare parts

2.2.3.1 Dismantle gas spring

Valid for gas springs with fill opening in the bottom of the cylinder pipe



WARNING!

Escaping nitrogen. High pressure

Escaping nitrogen can cause eye injuries.

- ▶ Open the valve carefully.
- ▶ Wear safety glasses.

- 1) Screw the threaded end of the valve tool into the fill opening until the valve opens.
- 2) Allow nitrogen to flow out slowly and completely.
- 3) After bleeding, use the other end of the valve tool to unscrew the valve completely from the thread.
- 4) Remove the valve from the fill opening using the valve tongs.
- 5) Place the gas spring upright on a flat surface.
- 6) Push the piston rod down completely.
- 7) Remove the colour identification ring.
- 8) Using the mini mounting sleeve and a rubber mallet, tap the fitting set downwards.



WARNING!

Eye injuries.

Retaining ring popping out.

- ▶ Hold the retaining ring in place.
- ▶ Wear safety glasses

- 9) Remove the retaining ring (a) with the retaining ring pliers.

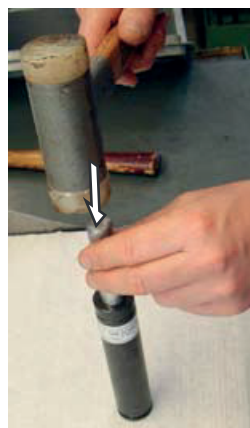
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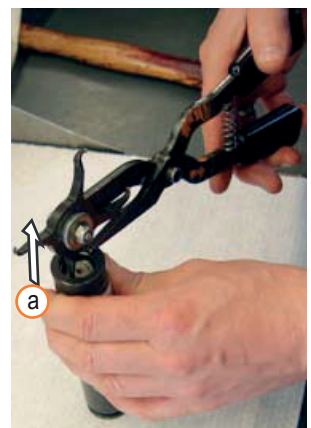
3.



8.



9.



- 10) Screw the disassembly handle into the thread of the piston rod.
 - 11) Pull the piston rod upwards by the disassembly handle.
 - 12) Remove the piston rod with the fitting set from the cylinder pipe.
 - 13) Unscrew the disassembly handle from the piston rod
 - 14) Pour out the oil from the cylinder pipe and dispose of it properly.
-

10.



12.



- 15) Pull the fitting set off the piston rod.
 - 16) Dispose of the valve, fitting set, retaining ring and colour identification ring.
 - 17) Store the cylinder pipe and piston rod.
-

16.



17.



Valid for gas springs with side fill opening



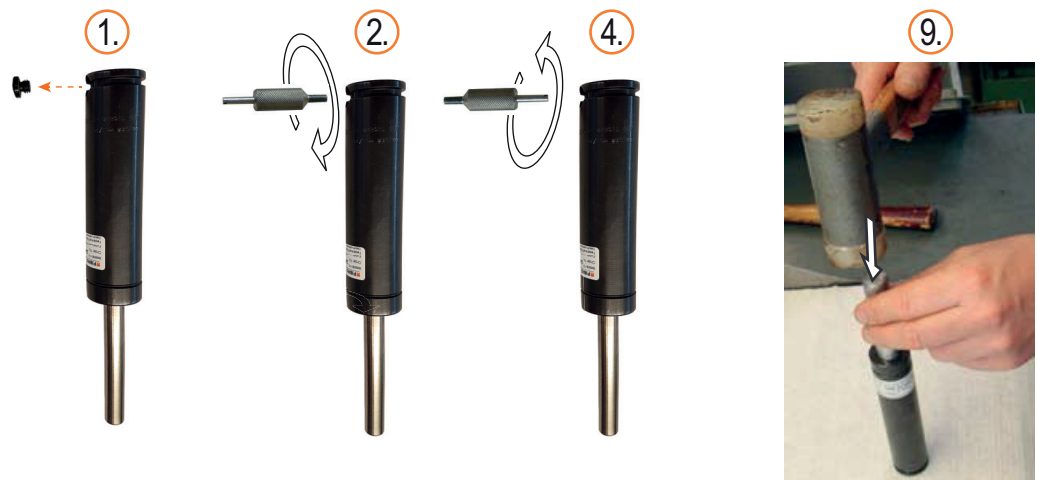
WARNING!

Escaping nitrogen. High pressure

Escaping nitrogen can cause eye injuries.

- ▶ Open the valve carefully.
- ▶ Wear safety glasses.

- 1) Unscrew the locking screw above the fill opening of the gas spring using an Allen key.
- 2) Screw the threaded end of the valve tool into the fill opening until the valve opens.
- 3) Allow nitrogen to flow out slowly and completely.
- 4) After bleeding, use the other end of the valve tool to unscrew the valve completely from the thread.
- 5) Remove the valve from the fill opening using the valve tongs.
- 6) Place the gas spring upright on a flat surface.
- 7) Push the piston rod down completely.
- 8) Remove the colour identification ring.
- 9) Using the mini mounting sleeve and a rubber mallet, tap the fitting set downwards.



**WARNING!****Eye injuries.**

Retaining ring popping out.

- ▶ Hold the retaining ring in place.
- ▶ Wear safety glasses

- 10) Remove the retaining ring (a) with the retaining ring pliers.
- 11) Screw the disassembly handle into the thread of the piston rod.
- 12) Pull the piston rod upwards by the disassembly handle.
- 13) Remove the piston rod with the fitting set from the cylinder pipe.
- 14) Unscrew the disassembly handle from the piston rod
- 15) Pour out the oil from the cylinder pipe and dispose of it properly.

10.



11.



13.



- 16) Pull the fitting set off the piston rod.
- 17) Dispose of the locking screw, valve, fitting set, retaining ring and colour identification ring.
- 18) Store the cylinder pipe and piston rod.

17.



18.



2.2.3.2 Clean and check components

- 1) Clean floor of the cylinder, piston rod and cylinder.
- 2) Check floor of the cylinder, piston rod and cylinder.

NOTICE

Leakage, damage to equipment.

Even minor damage to the cylinder or piston rod can result in leaks. A careful inspection is required. The installation of damaged parts is not permitted. Damaged parts must be replaced. The following illustration shows some examples of damaged parts.

The following illustration shows some examples of damaged parts.



2.2.3.3 Assemble gas spring

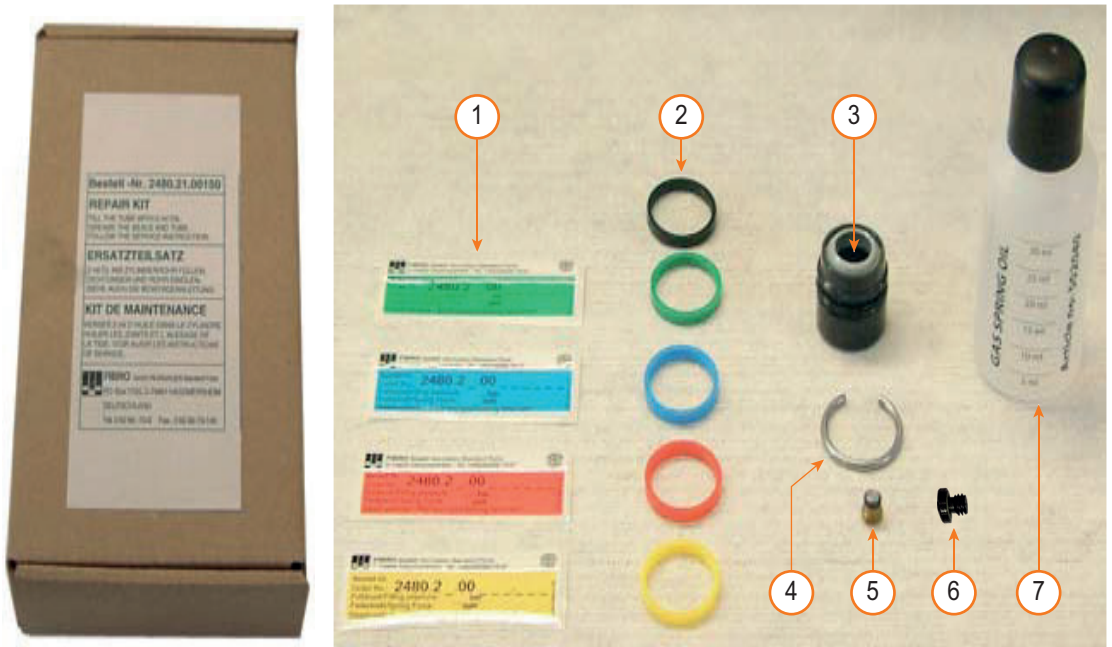
NOTICE

Jamming, damage to equipment.

Make sure that the correct piston rod is installed. To check this, place the unmounted piston rod in the cylinder. The upper end of the piston rod and the cylinder have to be in alignment.

Valid for all types			bar	dN
1	Label*	green:	45	50
		blue:	90	100
		red:	135	150
		orange:	180	200
2	Colour identification rings*	green:	45	50
		blue:	90	100
		red:	135	150
		orange:	180	200
		black:	variable	--
3	Fitting set			
4	Retaining ring			
5	Valve (not for spring type 2480.23.)			
6	Locking screw (only for gas springs with side fill opening)			
7	Special oil 35 ml (248.00.50.)			

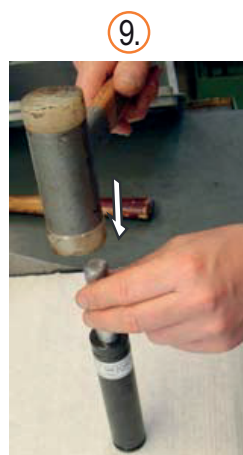
* The gas springs are suitable for operation with variable filling pressure. Select the label and colour identification ring depending on the filling pressure used.



- 1) Unpack the spare parts set.
- 2) Place the cylinder pipe upright on a flat surface.
- 3) Oil the new fitting set with the special oil.
- 4) Oil the piston rod with the special oil.
- 5) Slide the new fitting set over the piston rod. Ensure the correct installation position.
- 6) Oil the inside of the cylinder pipe with the special oil.
- 7) Fill the cylinder pipe with special oil.
 - **Oil quantity 2 ml.** Do not fill in too much oil, as this can increase the gas pressure.
- 8) Insert the piston rod with fitting set into the cylinder pipe.



- 9) Using the mini mounting sleeve and a rubber mallet, carefully tap the fitting set with piston rod downwards.
- 10) Fit the retaining ring into the groove.
 - First insert one end of the retaining ring into the groove and hold it with your thumb.
 - Then knock the ring down until it snaps into the groove with a clicking sound.
- 11) Screw the disassembly handle into the thread of the piston rod and pull the piston rod upwards as far as it will go.



- 12) Unscrew the disassembly handle from the piston rod.
- 13) Turn the gas spring over, insert the valve into the fill opening and tighten it with the valve tool.
 - 13a: for gas spring with fill opening in the bottom of the cylinder pipe.
 - 13b: for gas spring with side fill opening.
- 14) Place the gas spring upright on a flat surface and insert the colour identification ring.
 - The colour of the colour identification ring depends on the selected filling pressure (see Chapter 2.2.2.1 "Spare parts" on page 11).

13 a.



13 b.



14.



- 15) Fill gas spring with nitrogen (see Chapter 2.3 "Fill with nitrogen" on page 22).
- 16) Remove the previous label from the cylinder pipe.
- 17) Select a new label from the spare parts set and adhere it to the cylinder pipe.
 - The colour of the label depends on the selected filling pressure (see Chapter 2.2.2.1 "Spare parts" on page 11)



16.



17.



2.3 Fill with nitrogen

NOTICE

Damage to the gas pressure spring if other resources are used.

Use the resources listed for filling. The resources can be obtained from FIBRO GMBH.

Tools:

Pos.	Description	Article number
[A]	Filling and checking equipment	2480.00.32.21
[B]	Filling hose	2480.00.31.02
	Cylinder pressure reducer (optional)	2480.00.32.07

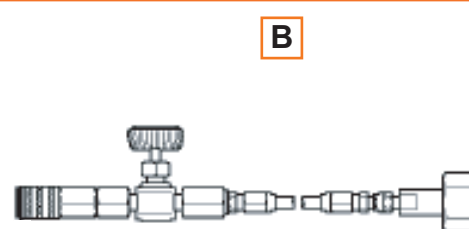


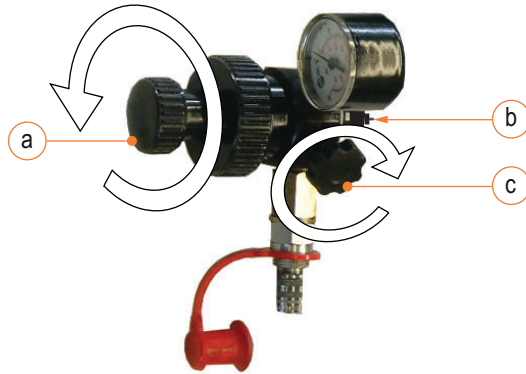
Fig. 2-9 Required tools



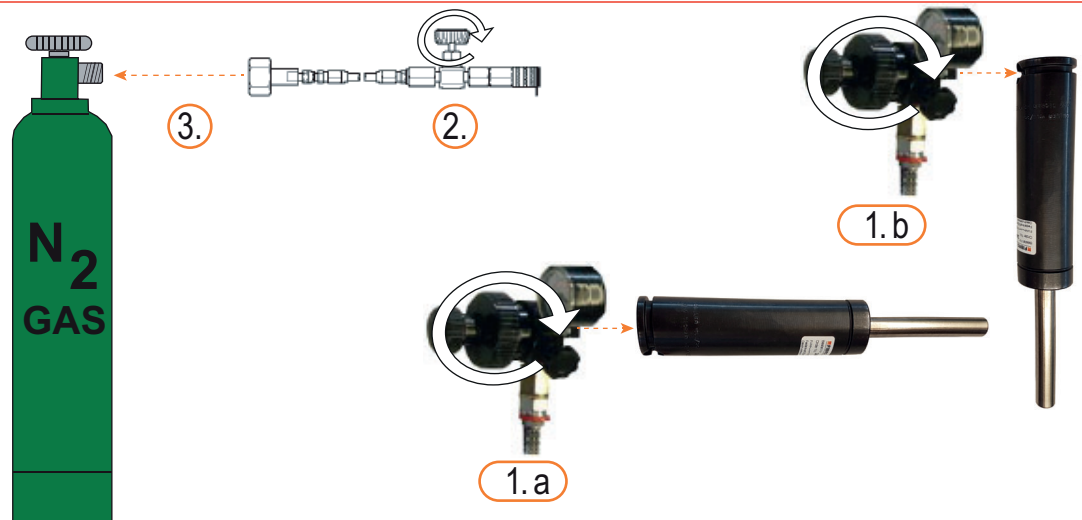
Observe the operating instructions for the filling and checking equipment 2480.00.32.21.

Filling and control fitting to be prepared

- Small turn knob (a) to be turned left until it arrests. This moves the tripping pin (b) into the retracted position.
- Outlet valve (c) to be connected.



- 1) Place the fill and control valve on the fill opening. Screw on by turning the large knob.
 - 1.a: for gas spring with fill opening in the bottom of the cylinder pipe.
 - 1.b: for gas spring with side fill opening.
- 2) Close the shut-off valve on the filling hose.
- 3) Screw the screw connection on the filling hose onto the nitrogen cylinder.



- 4) Plug the quick coupling sleeve of the filling hose onto the quick coupling plug of the filling and checking equipment.
- 5) Open the nitrogen cylinder by turning the knob on the cylinder valve.

NOTICE

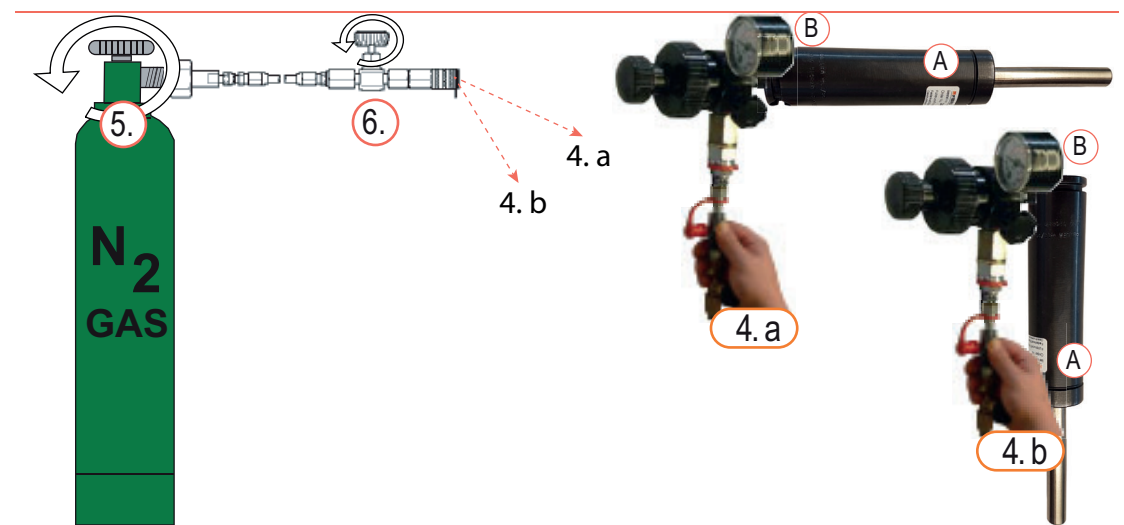
Damage to the valve in the gas spring.

- Slowly open the locking valve on the filling hose
- Carefully allow the nitrogen to flow in.

- 6) Slowly open the locking valve on the filling hose. The manometer (B) displays the filling pressure.



The filling pressure of the gas spring is variable and can be selected between the values 45 bar, 90 bar, 135 bar and 180 bar. The permissible filling pressure is printed on the label (A).



- 7) After reaching the filling pressure, close the shut-off valve on the filling hose.
- 8) Close the nitrogen cylinder on the cylinder valve knob.
- 9) Open the drain valve on the filling and checking equipment.
 - Pressure and residual nitrogen will escape from the fittings and filling hose.
- 10) Re-open the locking valve on the filling hose.
- 11) Loosen and unscrew the screw connection of the filling hose on the nitrogen cylinder.
- 12) Pull the filling hose off the filling and checking equipment.
- 13) Unscrew the fitting from the fill opening by turning the large knob.



WARNING!

Risk of injury. Escaping nitrogen

Never bend over the gas spring valve.

- Wear safety glasses.

- 14) Check that nitrogen is flowing out of the gas spring valve.



If nitrogen is escaping, the valve must be replaced (for removal, see chapter 2.2.3.1 "Dismantle gas spring" see chapter 14).

3 INDEXES

3.1 Third-party products

The product contains no components from third-party companies.

3.2 Glossary

Term	Explanation
Instructions	General designation for this document.
Tightening torque	Force with which a screw connection is tightened using a tool.
Product	General designation for the product described in these instructions.
Residual risk	Danger that could not be completely eliminated despite special design measures.
Safety notice	Notice in the instructions and manuals with reference to possible physical injuries.
Safety information	Information relating to the safe handling of a component.

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4.1 Personal notes

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More information at

www.fibro.de/downloads-springs-gas-springs/



FIBRO GMBH

Business Area Standard Parts
August-Läpple-Weg
74855 Hassmersheim
Germany
T +49 6266 73-0
info@fibro.de
www.fibro.com

THE LÄPPLE GROUP

LÄPPLE AUTOMOTIVE
FIBRO
FIBRO LÄPPLE TECHNOLOGY
LÄPPLE AUS- UND WEITERBILDUNG