MAINTENANCE INSTRUCTIONS

GAS SPRINGS COMPACT

2490.14.

Document: Maintenance instructions

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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: 32

These instructions are valid for the product

2490.14.

Gas springs Compact

2490.14.01000.

2490.14.01800.

2490.14.03000.

2490.14.04700.

2490.14.07500.

2490.14.11800.

2490.14.18300.

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

Contents

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:

DANGER!

A safety notice on a red signal bar with the signal word DANGER designates a hazard with a high risk level which, if not avoided, will result in death or severe injury.

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.

CAUTION!

A safety notice on a yellow signal bar with the signal word CAUTION designates a hazard with a low risk level which, if not avoided, could result in minor or moderate 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 Further applicable 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 wrong spare parts

Installation of wrong spare parts leads to a loss in safety.

- Parts may be ejected due to the internal pressure after filling with nitrogen.
- Always ensure prior to the repair that the right spares kit is used.
- PED-gas springs have a separate spares kit. Individual components are not compatible to the previous version. For the PED-gas springs the cylinder, installation kit and piston rod are marked at their upper end by grooves. Adhere to marking. PED-components and non-PED-components must not be mixed.
- Injuries due to parts blowing off.

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: 150 bar (2175 psi).

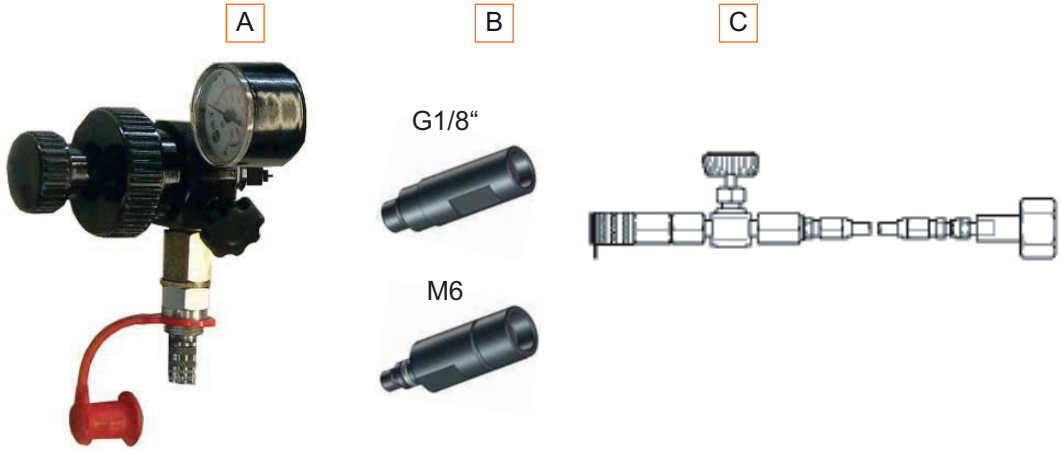
2 MAINTENANCE

2.1 Inspection

2.1.1 Check gas pressure

Resources

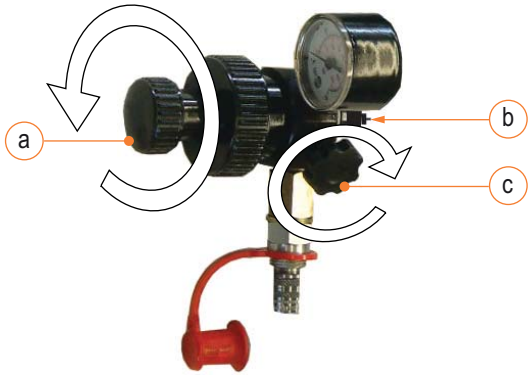
Item	Name	Article number
[A]	Filling and control fitting	2480.00.32.21
[B]	Filling adapter G1/8" (For gas springs 2490.14.01800 - 18300)	2480.00.32.11
	Filling adapter M6 (For gas springs 2490.14.01000)	2480.00.32.10
[C]	Filling hose	2480.00.31.02
	Bottle pressure regulator (optional)	2480.00.32.07



Adhere to operating instructions for the filling and control fitting 2480.00.32.21.

Filling and control fitting to be prepared

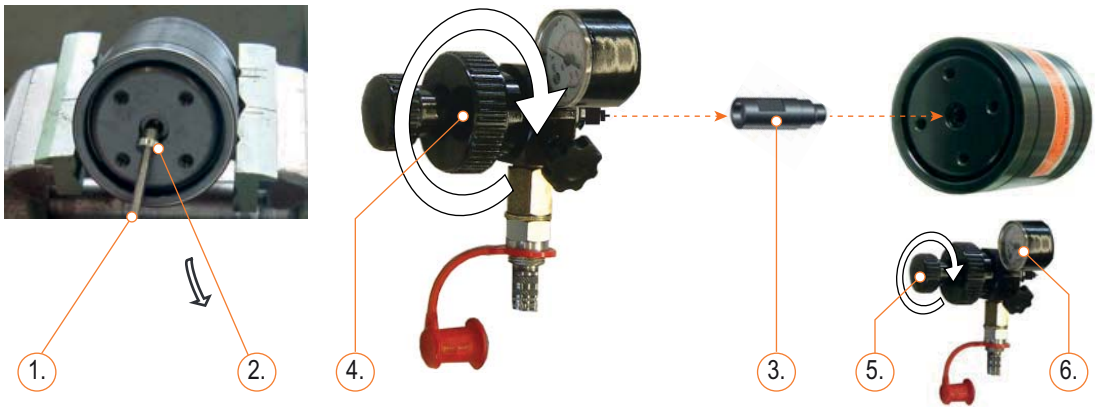
– Small turn knob (a) to be turned left until it arrests. This moves the tripping pin (b) into the retracted position.
– Outlet valve (c) to be connected.



NOTICE

Use the resources listed for the check. The resources can be obtained from FIBRO GmbH. Damage to the gas pressure spring if other resources are used.

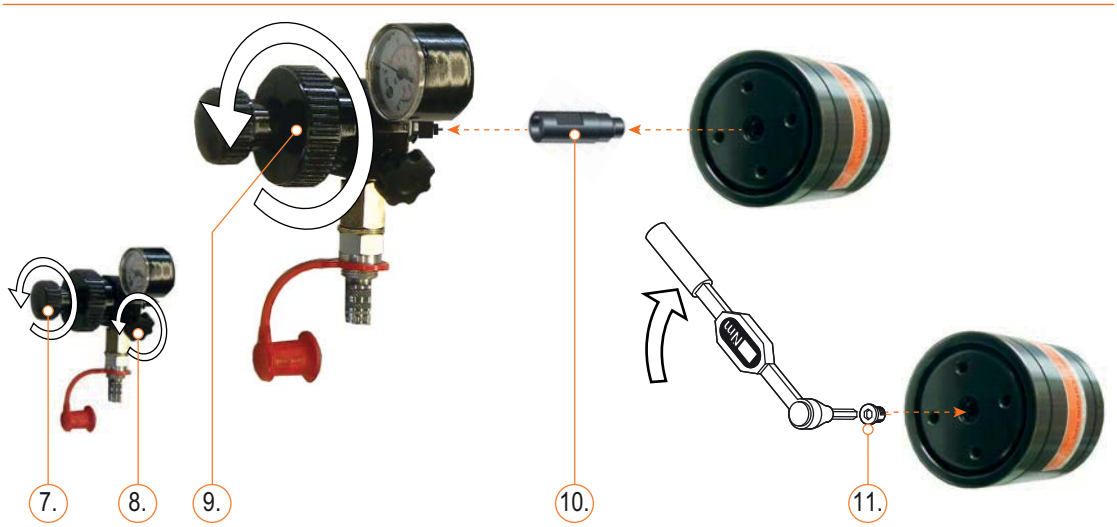
1) Remove the set screw above the filling opening of the gas spring with an Allen key.
   – If a mounting bracket is used, the filling opening is concealed. To check the gas pressure, the gas pressure spring needs to be removed. As an alternative, the gas pressure spring can be mounted using an adapter base plate. In this case, the filling opening is guided out at the side.
2) Unscrew and remove set screw.
3) Filling adapter to be screwed into the filling opening of the gas spring. Tighten hand-tight.
4) Filling and control fitting to be put on the filling adapter. Screw on the large turn knob by turning it.
5) Screw in the small turn knob. The tripping pin opens the valve. Caution! Do not screw in the tripping pin too far. This could damage the valve.
6) Read filling pressure on manometer display.



The permissible filling pressure is imprinted on the gas spring. Nitrogen has to be added if filling pressure is too low (see chapter 2.3 "Fill with nitrogen" on page 24).

7) After the check, open the small control knob. The detent pin goes back into retracted position and closes the valve.
8) Open control knob at discharge valve and vent filling and control fitting.
9) Unscrew filling and control fitting by turning the large turning knob from the filling adapter.
10) Filling adapter to be unscrewed.
11) Blanking plug to be inserted into filling opening of the gas spring..
   – Tightening torque for blanking plug, G1/8": 15 - 18 Nm (11-13 lb-ft)
   – Tightening torque for blanking plug, M6: 7 Nm (5 lb-ft)

The set screw has a sealing function and has always to be assembled.



2.2 Repairs

2.2.1 Required spare parts, tools and tool kits

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.

Spares kit gas spring 2490.14.

There are different spare part sets available depending on the installed spring. Prior to the repair, the correct spare kit set has to be available for the gas spring.

Spring typ	Spares kit
2490.14.01000.	2490.14.01000.
2490.14.01800.	2490.14.01800.
2490.14.03000.	2490.14.03000.
2490.14.04700.	2490.14.04700.
2490.14.07500.	2490.14.07500.
2490.14.11800.	2490.14.11800.
2490.14.18300.	2490.14.18300.

A spares kit consists of:

1	O-Ring	2	Backup ring
3	Valve VG5 (248.00.41)	4	Sticker
5	Guide ring	6	Special oil 35 ml (248.00.50.)
7	O-Ring	8	Blanking plug G1/8“ (248.00.43.1) Blanking plug M6 (248.31.0250.43)
9	Sealing lip	10	Stripper
11	O-Ring	12	Valve M6

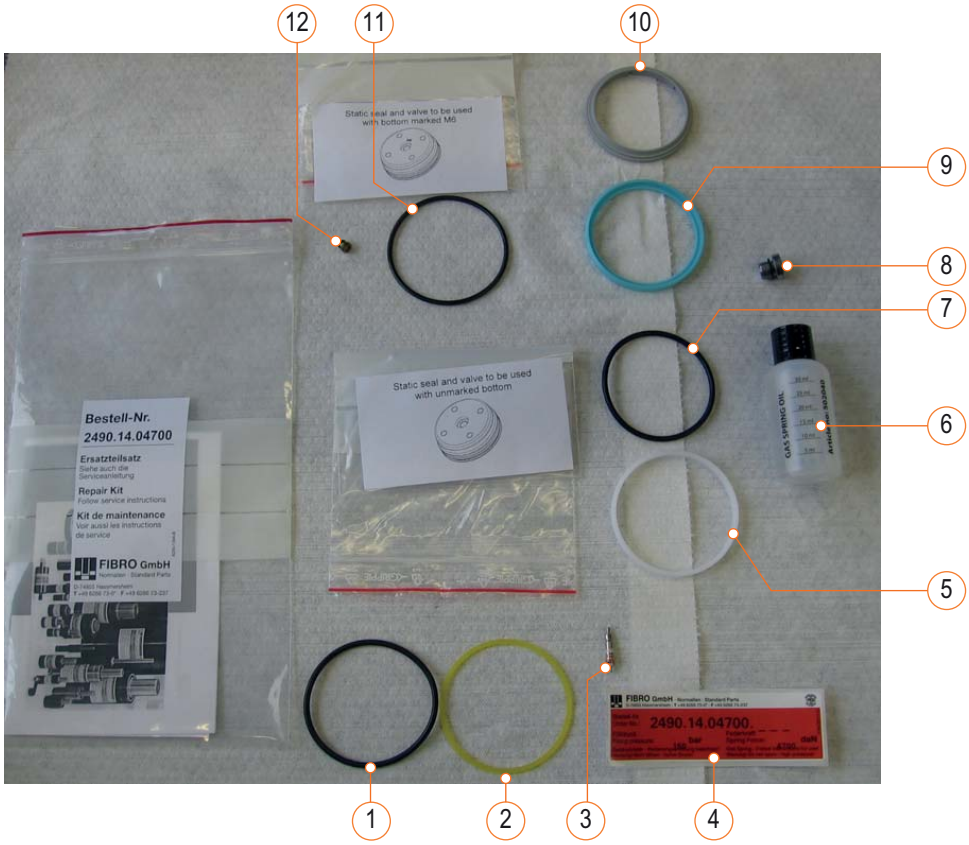


Fig. 2-1 Spares kit gas spring 2490.14.

For the gas spring 2490.14.04700. from KW14/2020 onwards, instead of positions 1, 2 and 3, positions 11 and 12 from the spares kit must be used. A support ring is not required for this type of spring.

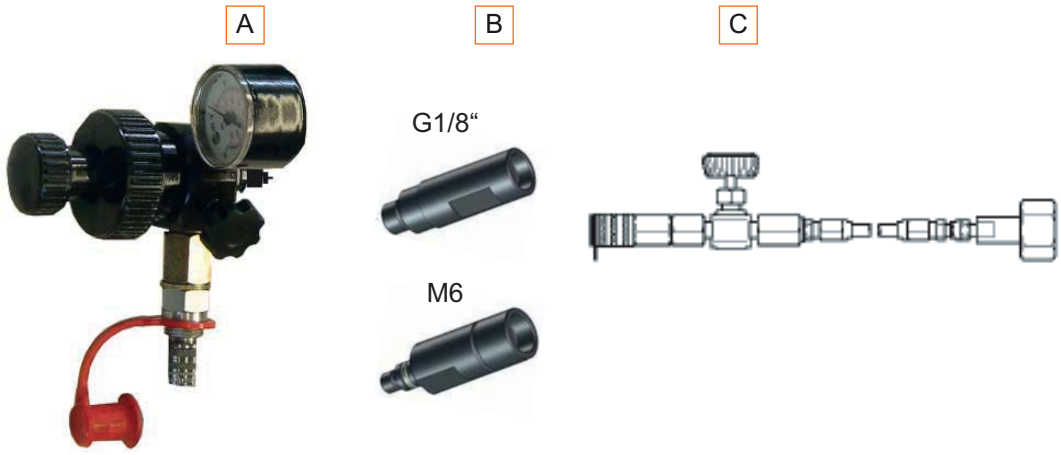
NOTICE

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.

Resources

Item	Name	Article number
[A]	Filling and control fitting	2480.00.32.21
[B]	Filling adapter G1/8" (For gas springs 2490.14.01800 - 18300)	2480.00.32.11
	Filling adapter M6 (For gas springs 2490.14.01000)	2480.00.32.10
[C]	Filling hose	2480.00.31.02
	Bottle pressure regulator (optional)	2480.00.32.07



Adhere to operating instructions for the filling and control fitting 2480.00.32.21.

Required tools from the tool kit 2480.00.50.11:

Item	Name		
(1)	T-tool G1/8	(2)	Circlip pliers
(3)	Valve pliers	(4)	Valve tool G1/8" Valve tool M6

Fig. 2-2 Required tools

An Allen key is necessary to open the blanking plug. A torque wrench with an Allen socket is necessary to tighten the blanking plug.

- 3 mm wrench width for M6 blanking plug
- 5 mm wrench width for G1/8" blanking plug

2.2.2 Replacement of spare parts

2.2.2.1 Dismantle gas spring

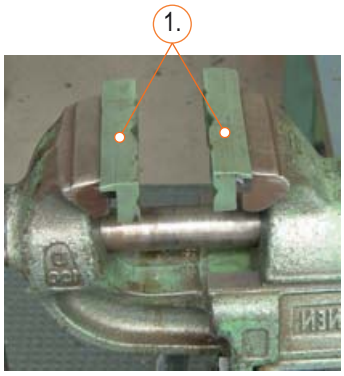
WARNING!

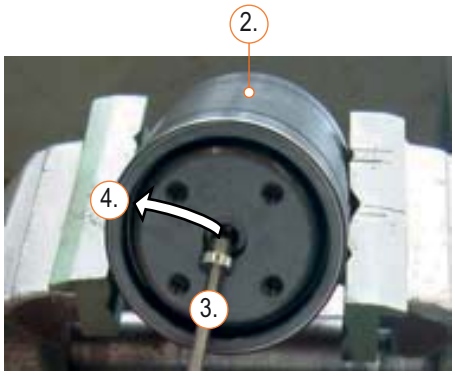
Nitrogen escaping. High pressure.

Nitrogen that escapes can cause eye injuries.

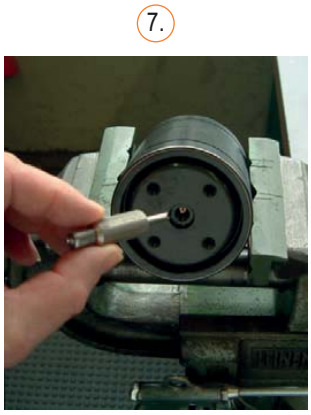
- ▶ Carefully open the valve.
- ▶ Wear safety goggles.

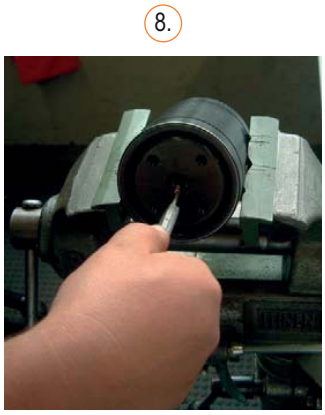
1) Insert protective jaws into vice.
2) Clamp gas spring in tilted position (approx. 30°) into vice. Piston rod slopes downwards.
3) Remove the set screw above the filling opening of the gas spring with an Allen key.
   – 3 mm wrench width for M6 blanking plug
   – 5 mm wrench width for G1/8" blanking plug
4) Unscrew and dispose off blanking plug.





5) Thread end of the valve tool has to be inserted so far into the filling opening until the valve opens.
6) Let nitrogen escape slowly and completely.
7) After emptying, use appropriate valve tool to unscrew the valve entirely from the thread.
8) Remove the valve from the filler opening using the valve pliers and dispose of it.

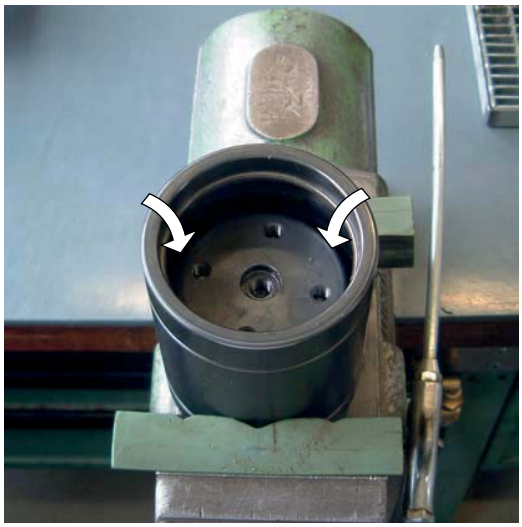




9) Clamp gas spring vertically into the vice.
10) Press the base down.

9.

10.



WARNING!

Eye injuries

Circlip pops out.

- ▶ Hold the circlip firmly in place.
- ▶ Wear safety goggles.

11) Remove circlip with circlip pliers.
12) Screw the T-lever into the base.
13) Pull the base out of the cylinder.

11.

12.

13.

14) Unscrew the T-lever from the base.
15) Put gas spring onto work desk. Use drip tray.
16) Push the piston rod down..
17) Remove the piston rod from the cylinder.

15.

16.

18) Pull the backup rind and the O-ring off the base and dispose of them.
- Note: The base of gas spring 2490.14.04700. from KW14/2020 does not have a backup ring.

19) Pull the stripper off the cylinder and dispose of it.
20) Pull the sealing ring, O-ring and guide ring off the piston rod and dispose of them.
21) Place the base, cylinder and piston rod in storage.

18. 19. 20.

2.2.2.2 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 cylinderor 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.

2.2.2.3 Assemble gas spring

NOTICE

Jamming, damage to equipment

Make sure that the correct piston rod is installed.

1) Unpack spares kit. Individual parts of the spares kit see chapter 2.2.1 "Required spare parts, tools and tool kits" on page 11.
2) Lubricate the piston rod with the special oil..

3) Pull the guide ring onto the piston rod.
4) Pull the sealing ring onto the piston rod.
5) Pull the O-ring onto the piston rod (Spares kit position 7).

6) Pull the backup ring onto the base.
   – Not required for gas spring 2490.14.04700. from calendar week 14/2020 (from serial number 2014xxxx). On this gas spring, the bottom is marked with an additional label "M6".

7) Pull the O-ring onto the base. (Spares kit position 1)
   – For gas spring 2490.14.04700. spares kit position 11.

8) Insert the stripper in the cylinder.

9) Lubricate all mounted parts with the special oil.
10) Clamp the cylinder upright in the bench vice.
11) Insert the piston rod.
12) Push the piston rod all the way down.

10.

11.

12.

13) Fill the special oil into the cylinder (for oil quantity, see table).
14) Screw the T-lever into the thread on the base.
15) Insert the base in the cylinder.
16) Align circlip into the groove.
- First insert one end of the circlip into the groove and then hold with thumb.
- Then drive the ring downwards until it comes to a rest in the groove making a clicking sound.

15.

16.

17) Pull the base all the way up at the T-lever.
18) Unscrew the T-lever from the base.
19) Insert valve (spares kit position 3) into the filling opening and tighten by hand with valve tool.
– For gas spring 2490.14.04700.: valve from spares kit position 12.

17.

19.

20) Fill gas spring with nitrogen (see chapter 2.3 "Fill with nitrogen" on page 24).

NOTICE

After filling with oxygen, the filler opening has to be sealed using the blanking plug.

21) Remove old label from cylinder.
22) Enter the nominal stroke on the label provided.
23) Stick the label with the entry on the cylinder.

Spring type	Stroke	Oil	Spring type	Stroke	Oil
2490.14.01000.	6 mm	1 ml	2490.14.01800.	6 - 25 mm	4 ml
	10 - 32 mm	2 ml		32 - 40 mm	6 ml
	40 mm	4 ml		50 - 65 mm	10 ml
	50 mm	6 ml			
2490.14.03000.	10 - 16 mm	4 ml	2490.14.04700.	10 - 25 mm	6 ml
	25 - 32 mm	6 ml		32 - 40 mm	10 ml
	40 - 65 mm	10 ml		50 - 65 mm	15 ml
2490.14.07500.	10 - 25 mm	10 ml			
	32 - 40 mm	15 ml			
	50 - 65 mm	20 ml			
2490.14.11800.	10 - 25 mm	20 ml	2490.14.18300.	10 - 25 mm	30 ml
	32 mm	30 ml		32 mm	40 ml
	40 mm	40 ml		40 - 50 mm	50 ml
	50 - 65 mm	50 ml		65 mm	60 ml

Tab. 2-1 Oil quantity

2.3 Fill with nitrogen

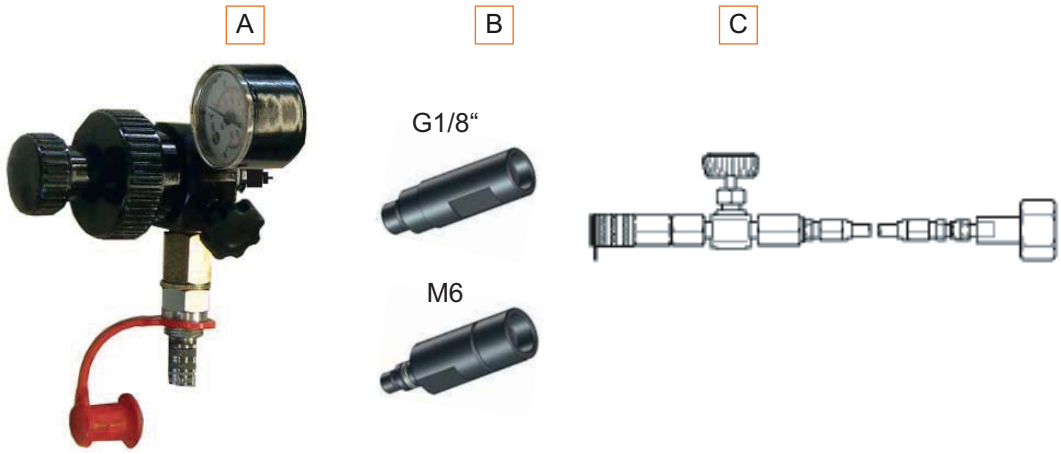
NOTICE

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.

Resources

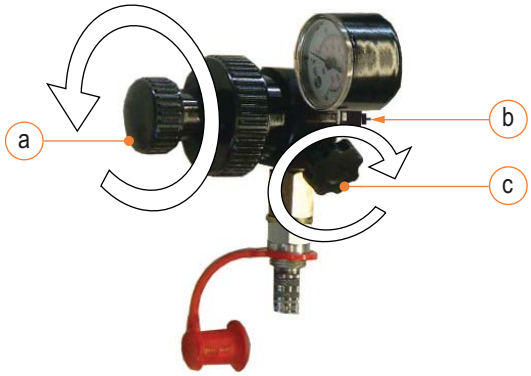
Item	Name	Article number
[A]	Filling and control fitting	2480.00.32.21
[B]	Filling adapter G1/8" (For gas springs 2490.14.01800 - 18300)	2480.00.32.11
	Filling adapter M6 (For gas springs 2490.14.01000)	2480.00.32.10
[C]	Filling hose	2480.00.31.02
	Bottle pressure regulator (optional)	2480.00.32.07



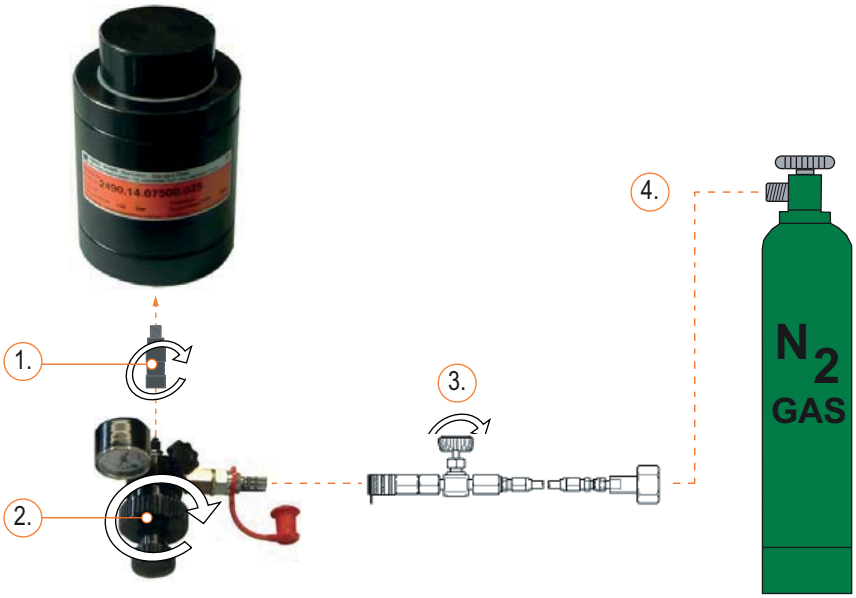
Adhere to operating instructions for the filling and control fitting 2480.00.32.21.

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) Filling adapter to be screwed into the filling opening of the gas spring. Tighten hand-tight.
2) Filling and control fitting to be put on the filling adapter. Screw on the large turn knob by turning it.
3) Shut-off valve has to be closed at the filling hose.
4) Screw the threaded connection of the filling hose to the nitrogen bottle.



5) Fit bayonet catch of the filling hose onto the filling and control fitting.
6) Nitrogen bottle has to be opened at the turn knob of the bottle valve.

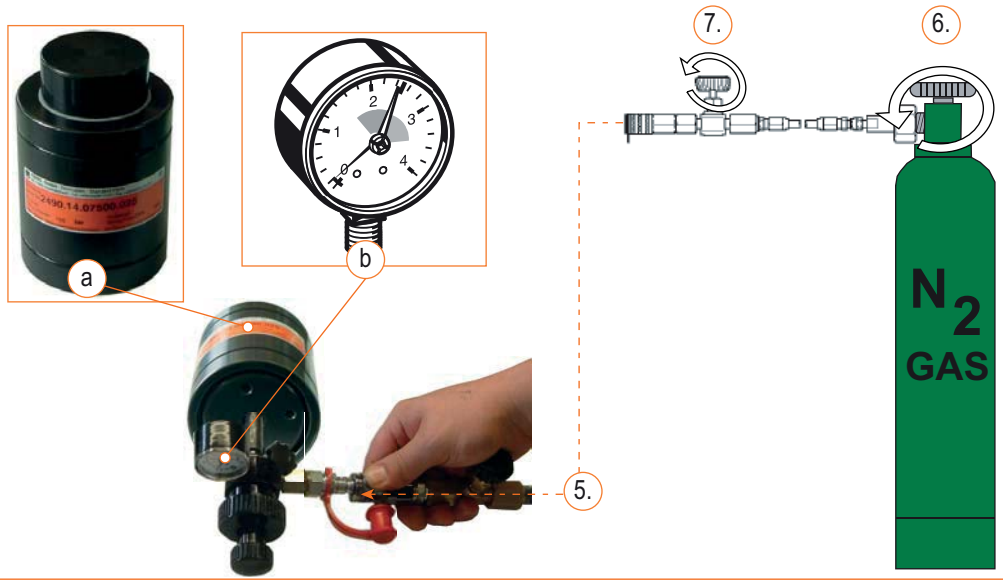
NOTICE

Damage to the valve in the gas pressure spring.

▶ Slowly open the shut-off valve on the filling hose.
▶ Carefully allow nitrogen to flow in.

7) Shut-off valve has to be opened slowly at the filling hose. Manometer (b) shows the filling pressure.

The permissible filling pressure (a) is imprinted on the gas spring.



8) After the filling pressure has been achieved close the shut-off valve at the filling hose.
9) Close nitrogen bottle at the control knob of the bottle valve.
10) Shut-off valve has to be opened slowly at filling hose.
11) Discharge valve has to be opened at the filling and control fitting.
    – Pressure and remaining nitrogen escape from the filling and control fitting and filling hose.
12) Release and unscrew the threaded connection of the filling hose from the nitrogen bottle.
13) Remove filling hose at the bayonet catch from the filling and control fitting.
14) Unscrew filling and control fitting by turning the large turning knob from the filling adapter.
15) Filling adapter to be unscrewed.
16) Clamp gas spring vertically into the vice.

⚠ WARNING!

Risk of injury. Nitrogen escaping

Never bend over the valve of the gas pressure spring.

▶ Wear safety goggles.

17) Check if nitrogen escape from the valve of the gas spring.

If oxygen escapes, the valve needs to be replaced (removal see chapter 2.2.2.1 ; installation see chapter 2.2.2.3).

18) Blanking plug to be inserted into filling opening of the gas spring.
- Tightening torque for blanking plug, G1/8": 15 - 18 Nm (11-13 lb-ft)
- Tightening torque for blanking plug, M6: 7 Nm (5 lb-ft)
- 5 mm wrench width for G1/8" blanking plug
- 3 mm wrench width for M6 blanking plug

The set screw has a sealing function and has always to be assembled.

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.

3.3 Index of figures

3.4 Index of tables

3.5 Index

4 APPENDIX

4.1 Personal notes

FIBRO GMBH

Business Area Standard Parts
August-Läpple-Weg
74855 Hassmersheim
Germany
T +49 06266 73-0
info@fibro.de

THE LÄPPLE GROUP

LÄPPLE AUTOMOTIVE
FIBRO
FIBRO LÄPPLE TECHNOLOGY
LÄPPLE AUS- UND WEITERBILDUNG

LOCATIONS

FIBRO France Sarl

Département Eléments normalisés
26 Avenue de l'Europe
67300 Schiltigheim
France
T +33 3 90 20 40 40
info@fibro.fr

FIBRO INDIA

PRECISION PRODUCTS PVT. LTD.
Business Area Standard Parts
Plot No: A-55, Phase II, Chakan Midc,
Taluka Khed, Pune - 410 501
India
T +91 21 35 33 88 00
info@fibro-india.com

FIBRO ASIA PTE. LTD.

Business Area Standard Parts
9 Changi South Street 3, #07-04
Singapore 486361
Singapore
T +65 65 43 99 63
info@fibro-asia.com

FIBRO INC.

Business Area Standard Parts
39 Harrison Avenue
Rockford, IL 61104
USA
T +1 815 2 29 13 00
info@fibroinc.com

FIBRO (SHANGHAI)

PRECISION PRODUCTS CO., LTD.
Business Area Standard Parts
1st Floor, Building 3, No. 253, Ai Du Road
Pilot Free Trade Zone, Shanghai 200131
China
T +86 21 60 83 15 96
info@fibro.cn

FIBRO KOREA CO., LTD

203-603, Bucheon Technopark
Ssangyong 3
397, Seokcheon-ro, Ojeong-gu,
Bucheon-si, Gyeonggi-do
Korea
T +82 32 624 0630
fibro_korea@fibro.kr

FIBRO POLSKA SP. Z O. O.

ALEJA ARMII KRAJOWEJ 220
PAWILON AG PIĘTRO 3/ POKÓJ 306
43-316 BIELSKO-BIAŁA
POLSKA
T +(48) 6980 57720

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