Maintenance instructions

Gas springs

2480.12./13.00250.-10000.
2480.92./93.00750.-05000.
2481.12./13.00750.-05000.
2483.12./13.00750.
2484.12./13.00750.-07500.

FIBRO

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1 Safety

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.

The signal boards used in these instructions have the following meanings:

WARNING	**WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**
NOTICE	***NOTICE* is used to address practices not related to personal injury.**

⚠ WARNING

Filled gas springs are subject to high internal pressure.

Empty nitrogen completely before carrying out any repairs. Open valve carefully and only slightly to do so. Wear safety glasses. Eye injuries possible due to escaping nitrogen.

Never bend over the valve after removing blanking plug. Never direct the filling opening at a person. Only unscrew valve once nitrogen has completely emptied. Possible injuries due to valve blowing off.

If assembled incorrectly, there is a risk of parts being hurled outwards. Adhere to exact installation position of spare parts. Never direct the piston rod at a person. Injuries due to parts blowing off.

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 N_2 of Grade 5.0 purity or higher.

Highest permissible filling pressure: 150 bar (2175 psi) . For gas spring 2483.12./ 13.00750. max. 120 bar (1740 psi).

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.

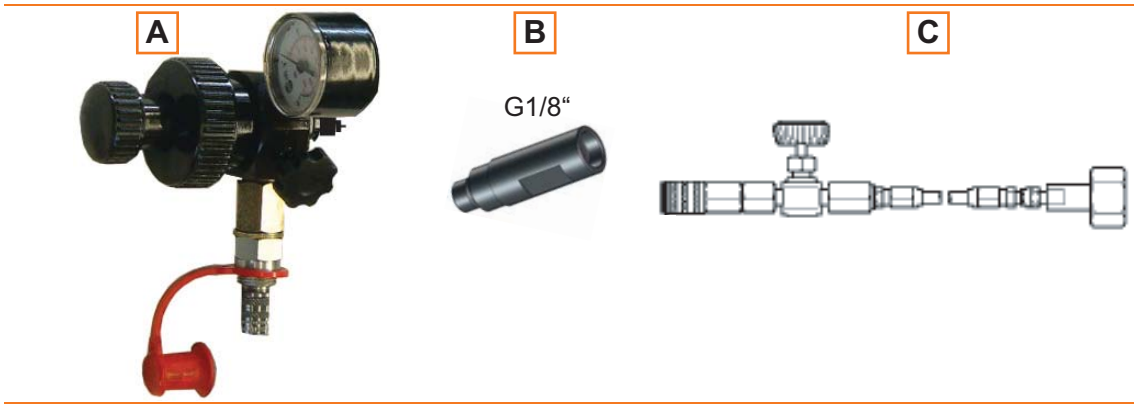
2 Maintenance

2.1 Inspection

2.1.1 Check gas pressure

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

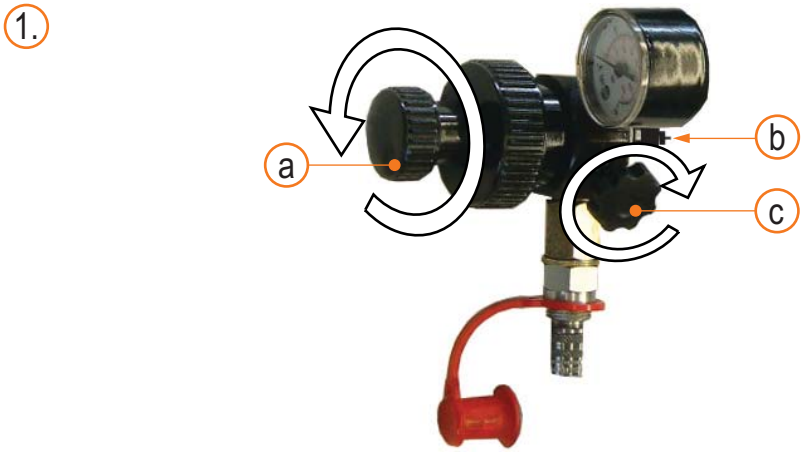
Item	Name	Article number
[A]	Filling and control fitting	2480.00.32.21
[B]	Filling adapter G1/8" (For gas springs with G1/8" threaded filling connection. In the case of gas springs with M6 threaded filling connection, the filling and control fitting can be screwed directly into the filling opening.)	2480.00.32.11
[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.

2.1 Inspection

1. 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.



2. Remove the blanking plug above the filling opening of the gas spring with an Allen key (M6 - 3 mm; G1/8" - 5 mm).
3. Unscrew and remove set screw.
4. Filling adapter to be screwed into the filling opening of the gas spring. Tighten hand-tight.
   - Not necessary for spring type 2480.13.00250.
5. Filling and control fitting to be put on the filling adapter. Screw on the large turn knob by turning it.
6. 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.
7. 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 2.4 „Fill with nitrogen“ on page 22).

8. After the check, open the small control knob. The detent pin goes back into retracted position and closes the valve.
9. Open control knob at discharge valve and vent filling and control fitting.
10. Unscrew filling and control fitting by turning the large turning knob from the filling adapter.
11. Filling adapter to be unscrewed.
12. Blanking plug to be inserted into filling opening of the gas spring. Tighten with a torque of 2 Nm (1,5 lb-ft) for M6; 15 - 18 Nm (11-13 lb-ft) for G1/8".

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

2.2 Repair

2.2.1 Required spare parts, tools and tool kits.

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 type	Spares kit
2480.12.	2480.12.xxxxx
2480.13.	2480.13.xxxxx
2480.92. / 93.	2480.13.xxxxx
2480.92. / 93.01500.	2480.12.01500
2481.12.	2481.12.xxxxx
2481.13.	2481.13.xxxxx
2483.12.00750.	2483.12.00750
2483.13.00750.	2483.13.00750
2484.12.	2484.12.xxxxx
2484.13.	2484.13.xxxxx
Order number extension .xxxxx states nominal force of spring	

A spares kit consists (except 2480.13.00250.) of:

(1) Blanking plug (248.00.43.1)
(2) Valve (248.00.41)
(3) Circlip
(4) Dirt protection ring
(5) Installation kit
(6) Guide ring
(7) Special oil 35 ml (248.00.50.)
(8) Sticker

A spares kit (Spring type 2480.13.00250.) consists of:

(1) Blanking plug (2480.00.41.2)
(2) Valve (2480.00.41.1)
(3) Circlip
(4) Dirt protection ring
(5) Installation kit
(6) Special oil 35 ml (248.00.50.)
(7) Sticker

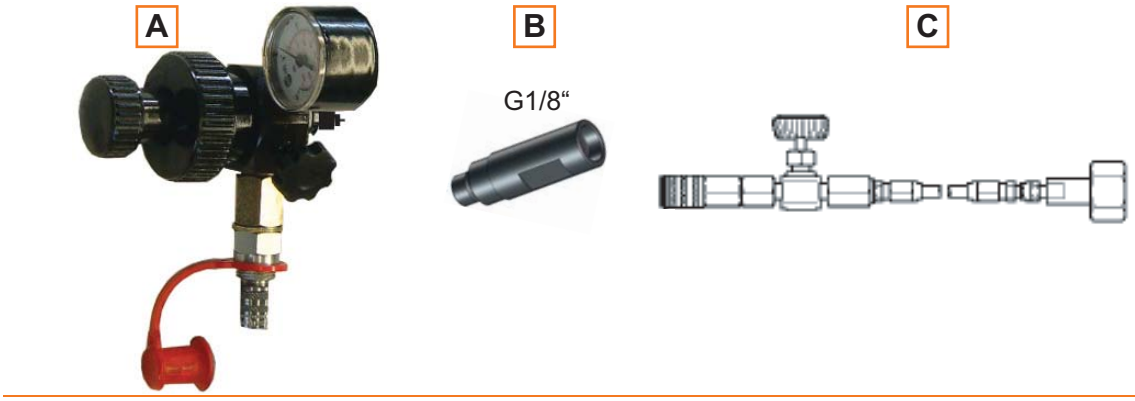
NOTICE Only use genuine spare parts from FIBRO GmbH. All spare parts included in the spare parts kit must always be replaced completely. Damage to the gas pressure spring if other spare parts are used.

NOTICE Use the resources and special tools listed below for repairs. The resources and tools can be obtained from FIBRO GmbH. Damage to the gas pressure spring if other resources and tools are used.

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

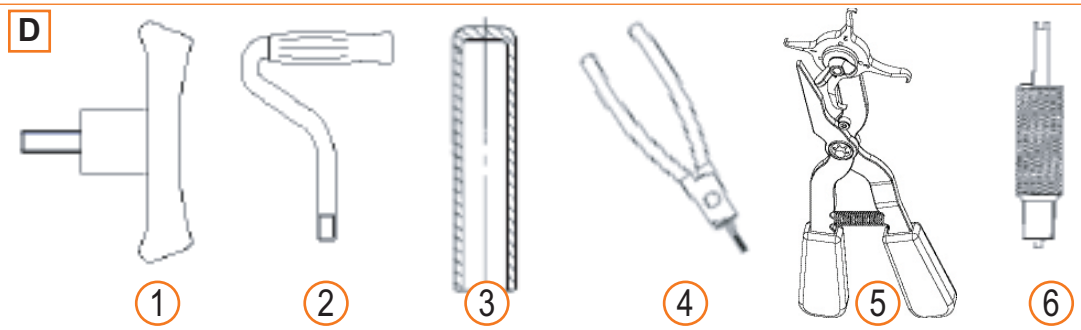
Tools:

Item	Name	Article number
[A]	Filling and control fitting	2480.00.32.21
[B]	Filling adapter G1/8" (For gas springs with G1/8" threaded filling connection. In the case of gas springs with M6 threaded filling connection, the filling and control fitting can be screwed directly into the filling opening.)	2480.00.32.11
[C]	Filling hose	2480.00.31.02
-	Bottle pressure regulator (optional)	2480.00.32.07



Tool kits:

Item	Name		
[D]	Complete tool kit (2480.00.50.11), consisting of		
(1)	T-tool M6 / M8	(2)	T-tool M16
(3)	Assembly sleeve	(4)	Valve pliers
(5)	Circlip pliers	(6)	Valve tool G1/8"

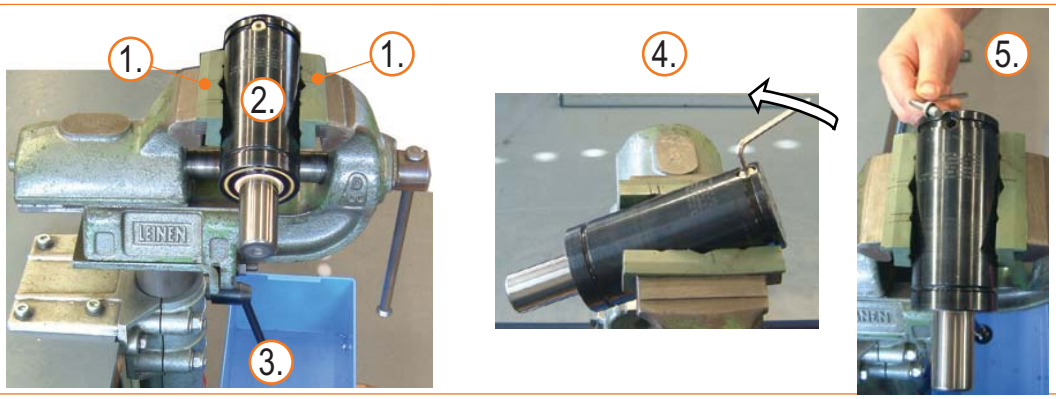


An Allen key is necessary to open the blanking plug.
(5 mm; 2480.13.0250. = 3 mm).
A torque wrench with an Allen socket is necessary to tighten the blanking plug
(5 mm; 2480.13.0250. = 3 mm).

2.3 Replacement of spare parts

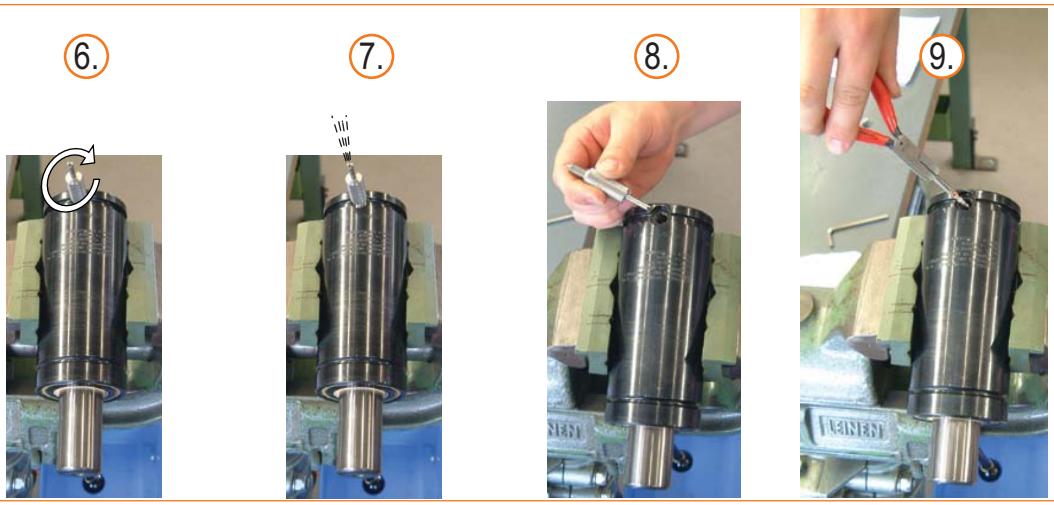
2.3.1 Dismantle gas spring

1. Insert protective jaws into vice.
2. Clamp gas spring in tilted position (approx. 30°) into vice. Piston rod slopes downwards.
3. Put container under gas spring to catch discharging oil.
4. Remove the blanking plug above the filling opening of the gas spring with an Allen key (M6 - 3 mm; G1/8" - 5 mm).
5. Unscrew and dispose off blanking plug.



⚠ WARNING Nitrogen escaping. High pressure. Carefully open the valve. Wear safety goggles. Nitrogen that escapes can cause eye injuries.

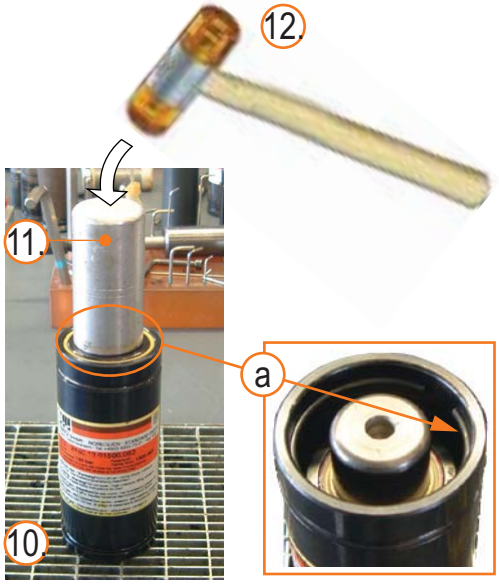
6. Thread end of the valve tool has to be inserted so far into the filling opening until the valve opens.
7. Let nitrogen escape slowly and completely.
8. After emptying, use the other end of the valve tool to unscrew the valve entirely from the thread.
9. Remove valve from the filling opening using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

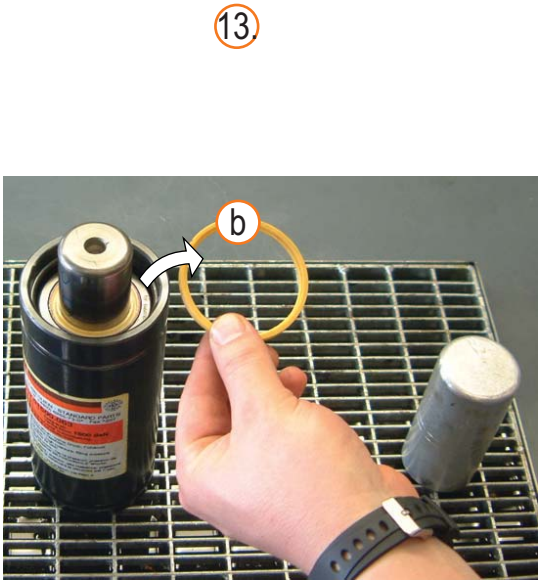


10. Put gas spring onto work desk. Use drip tray.
11. Put assembly sleeve over the piston rod.

For spring types 2480.13.00250./00500. and 2480.13.03000. the dirt protection ring has to be taken off before the installation kit is driven into the pipe.

12. Using a rubber mallet, drive installation kit so far into the cylinder until the circlip (a) becomes visible.
13. Remove dirt protection ring (b).

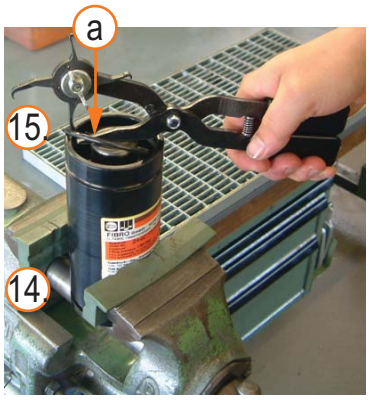




14. Clamp gas spring vertically into the vice.

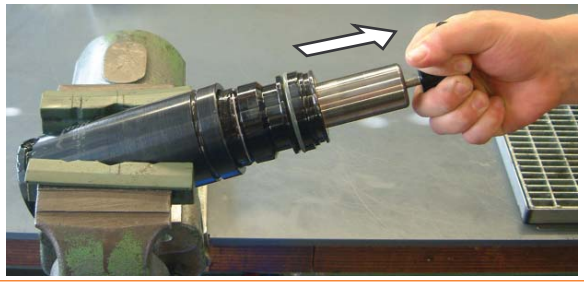
⚠ WARNING Jumping out circlip. Wear safety glasses. Eye injuries.

15. Remove circlip (a) with circlip pliers.
16. Re-clamp gas spring in vice. Tilted position (about 30°). Piston rod tilts upwards.
17. Insert T-tool into piston rod.



18. Pull piston rod with piston disks and the installation kit from the cylinder.
19. Unscrew T-tool from the piston rod.
20. Take cylinder from vice and pour out oil.

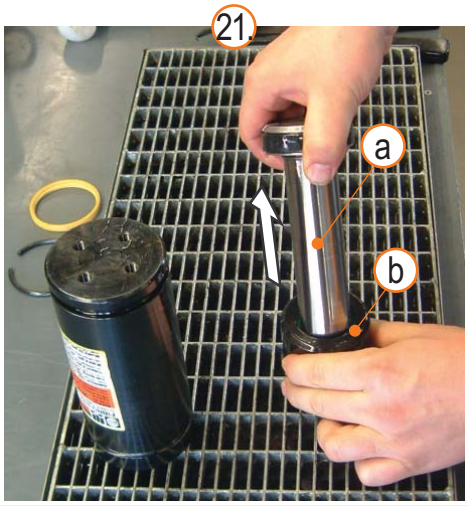
18.



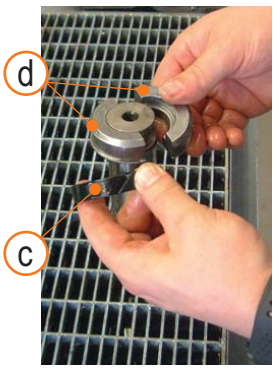
20.

21. Pull out piston rod (a) from installation kit (b).
22. Remove guide ring (c) and take off both piston disks (d).
    - Not for spring type 2480.13.00250. (no guide ring, no piston disks)

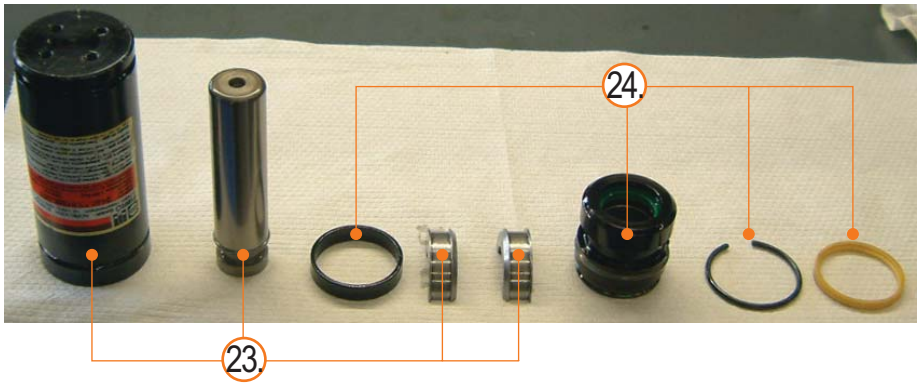
21.



22.



23. Keep cylinder, piston rod and piston disks.
24. Dispose off guide ring, installation kit, circlip and dirt protection ring.



- Spring type 2480.13.00250.: Keep cylinder and piston rod
- Spring type 2480.13.00250.: Dispose off installation kit, circlip and dirt protection ring.

2.3.2 Clean and check components.

1. Clean cylinder, piston rod and piston disks.
2. Check piston rod and cylinder.

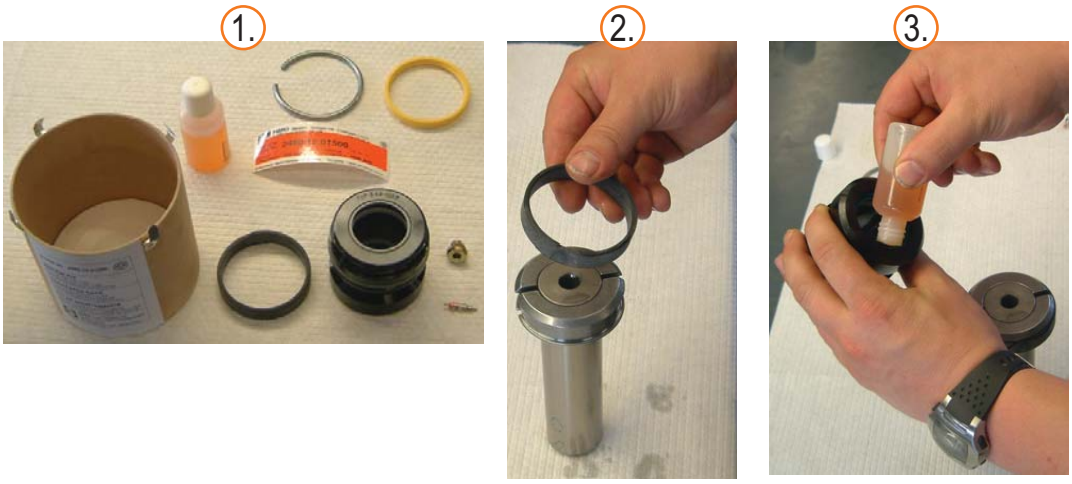
NOTICE Leakage, damage to equipment. Even minor damage to the cylinder or piston rod can result in leaks. A careful inspection is required. The installation of damaged parts is not permitted. Damaged parts must be replaced.

The following illustration shows some examples of damaged parts.

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.

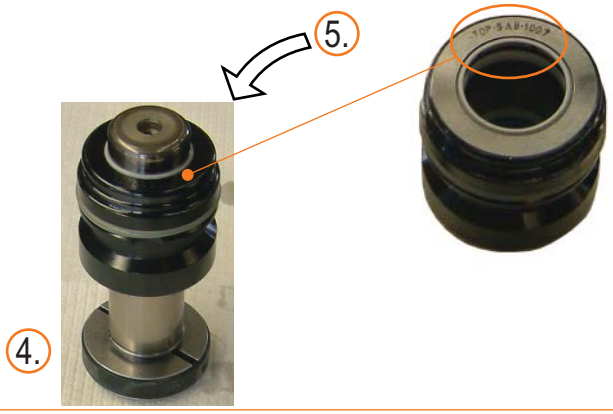
1. Unpack spares kit.
2. Put piston disks onto the piston rod. Fix with new guide ring.
   - Not for spring type 2480.13.00250. (no guide ring, no piston disks)
3. Lightly oil the inner seals and socket on the new installation kit with the special oil.



4. Put the piston rod with the piston disks downwards onto the work desk.

⚠ WARNING Faulty assembly. Faulty assembled installation kit can release the circlip during subsequent filling with nitrogen. Piston rod can be ejected. Please adhere to markings on the installation kit. Injuries due to parts blowing off.

5. Insert installation kit onto the piston rod. Marking "TOP" has to face upwards.



6. Slightly oil outer seals on the new installation kit.

ⓘ Prior to filling the special oil position the cylinder of spring types .00250., .00500. and .00750. that the oil cannot escape from the filling opening.

7. Fill special oil into the cylinder (for oil quantities check table 1 on page 19).

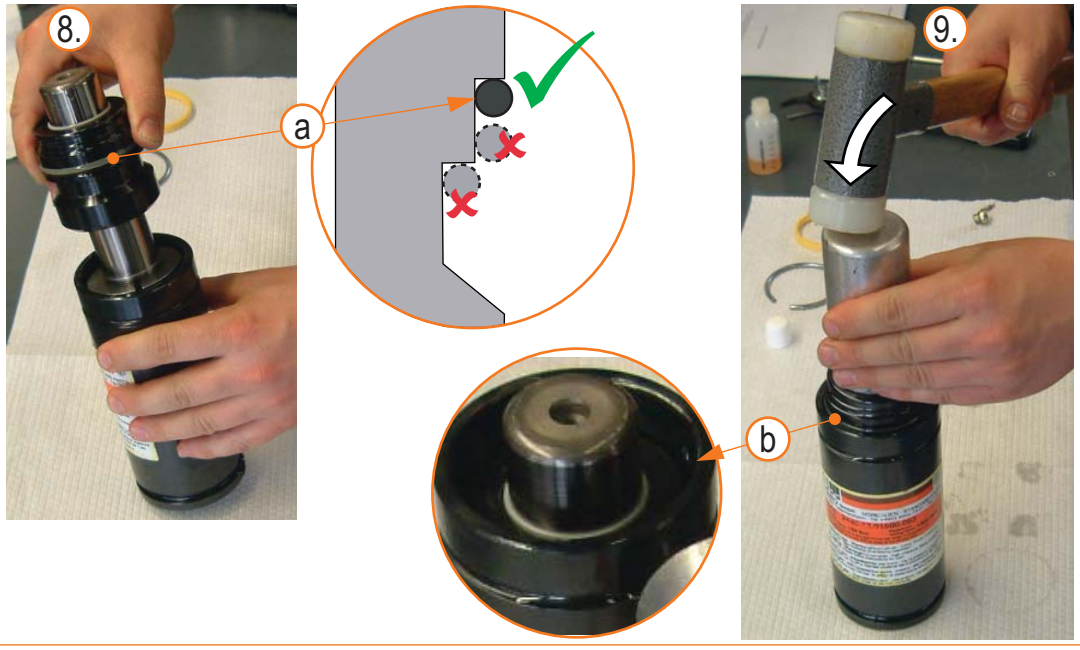
Spring type	Size	Quantity
2480.13.	00250.	4 ml
2480.12. / 2480.13.	00500.	8 ml
2480.12. / 13. / 92. / 93. 2483.12. / 13. 2484.12 / 13.	00750.	10 ml
2480.12. / 92. / 93. 2484.12.	01500.	30 ml
2480.12. / 13. / 92. / 93. 2484.12. / 13.	03000.	40 ml
2480.12. / 13. / 93. 2484.12. / 13.	05000.	40 ml
2480.12. / 13. 2484.12. / 13.	07500.	60 ml
2480.12. (Stroke 25 - 99 mm)	10000.	90 ml
2480.12. (Stroke 100 - 300mm)	10000.	140 ml
2481.12.	00750.	30 ml
2481.12. / 13.	01500.	40 ml
2481.12. / 13.	03000.	60 ml
2481.12. / 13.	05000.	120 ml
NOTICE Use special high temperature oil for 2483.12. / 13.00750.		

Tab. 1:Oil quantities

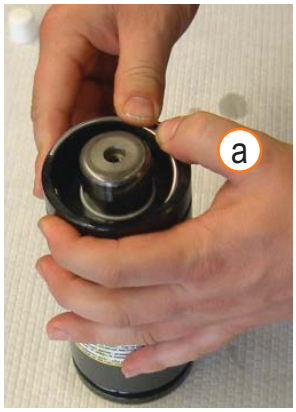
8. Insert piston rod with the installation kit into the cylinder.

Ensure correct position of outer O-ring (a).

9. Put assembly sleeve over the piston rod. Drive installation kit with a rubber mallet so far down until the groove for the circlip (b) is exposed.

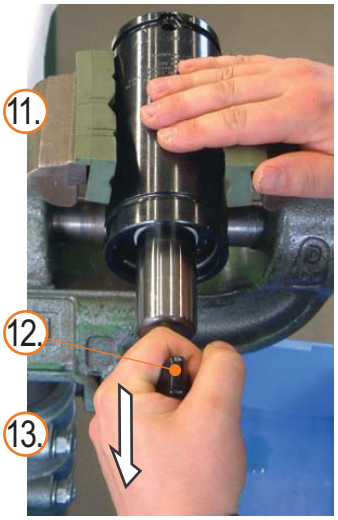


10. Align circlip into the groove.
    - First insert one end of the circlip into the groove (a) and then hold with thumb.
    - Then drive the ring downwards (b) until it comes to a rest in the groove making a clicking sound.



10.

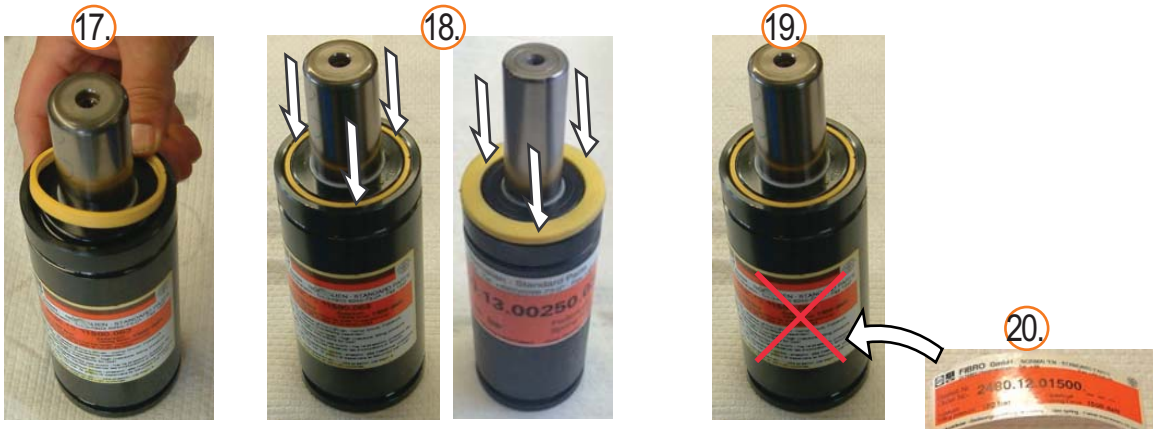
11. Clamp gas spring in tilted position (approx. 30°) into vice. Piston rod slopes downwards.
12. Insert T-tool into piston rod.
13. Pull out piston rod. The installation kit has to align with the upper end of the cylinder. If the installation kit does not align with the upper end of the cylinder, then the assembly is faulty.
14. Unscrew T-tool from the piston rod.
15. Insert valve into the filling opening and tighten by hand with valve tool.



16. Put gas spring onto work desk.
17. Slightly grease dirt protection ring and insert onto cylinder.
18. Press down dirt protection ring.

ⓘ The dirt protection ring prevents dirt from entering the gas spring and always has to be installed.

19. Remove old label from cylinder.
20. Stick provided new label onto cylinder and insert nominal stroke at the label.



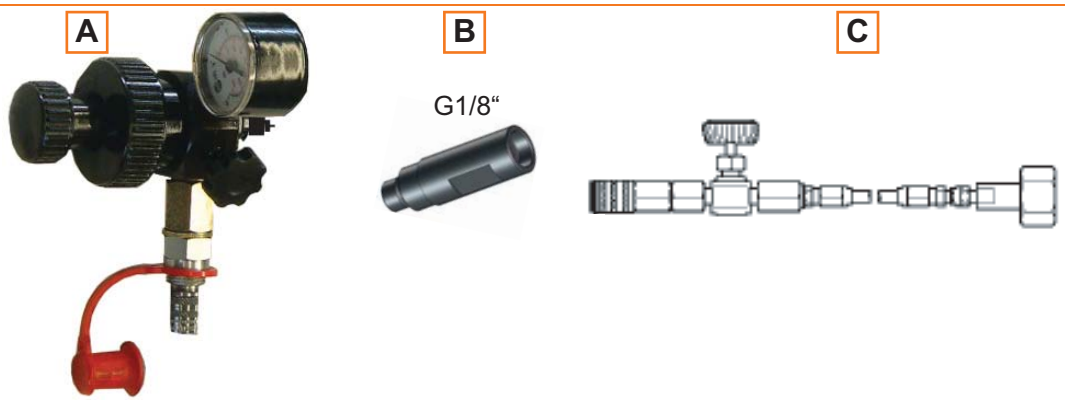
2480.13.00250.
2480.13.00500.

21. Fill gas spring with nitrogen (see chapter 2.4 „Fill with nitrogen“ on page 22).

2.4 Fill with nitrogen

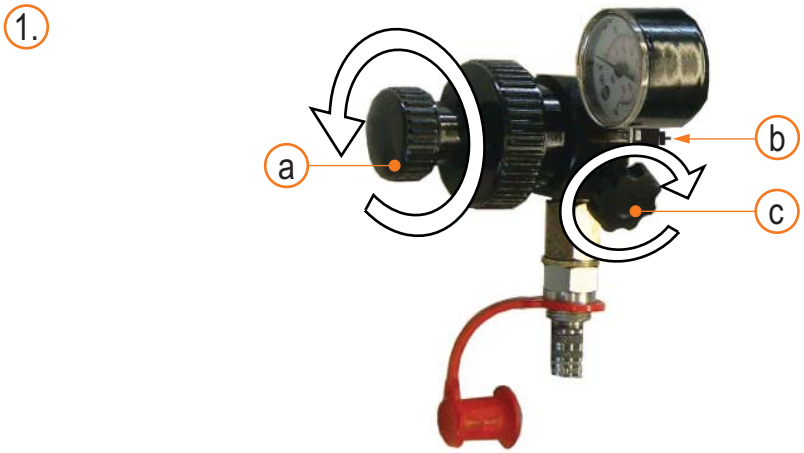
NOTICE Use the resources listed below for filling. The resources can be obtained from FIBRO GmbH. Damage to the gas pressure spring if other resources are used.

Item	Name	Article number
[A]	Filling and control fitting	2480.00.32.21
[B]	Filling adapter G1/8" (For gas springs with G1/8" threaded filling connection. In the case of gas springs with M6 threaded filling connection, the filling and control fitting can be screwed directly into the filling opening.)	2480.00.32.11
[C]	Filling hose	2480.00.31.02
-	Bottle pressure regulator (optional)	2480.00.32.07

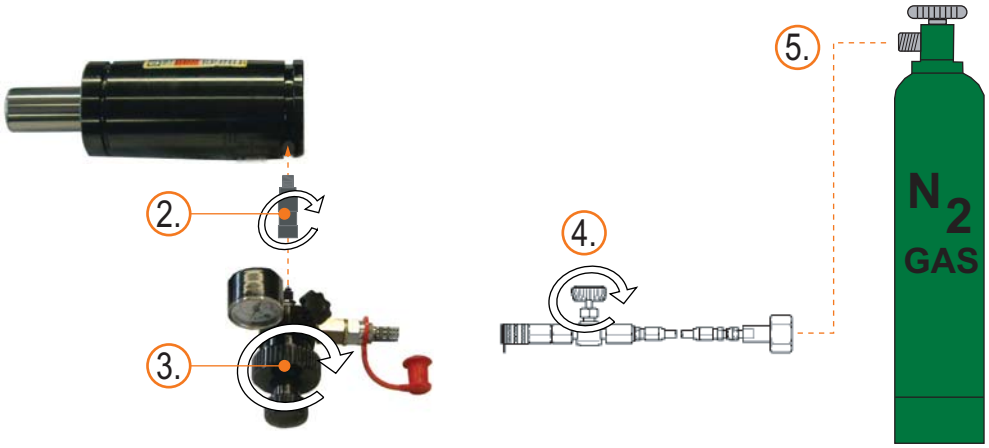


Adhere to operating instructions for the filling and control fitting 2480.00.32.21.

1. 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.



2. Filling adapter to be screwed into the filling opening of the gas spring. Tighten hand-tight.
   - Not necessary for spring type 2480.13.00250.
3. Filling and control fitting to be put on the filling adapter. Screw on the large turn knob by turning it.
4. Shut-off valve has to be closed at the filling hose.
5. Screw the threaded connection of the filling hose to the nitrogen bottle.

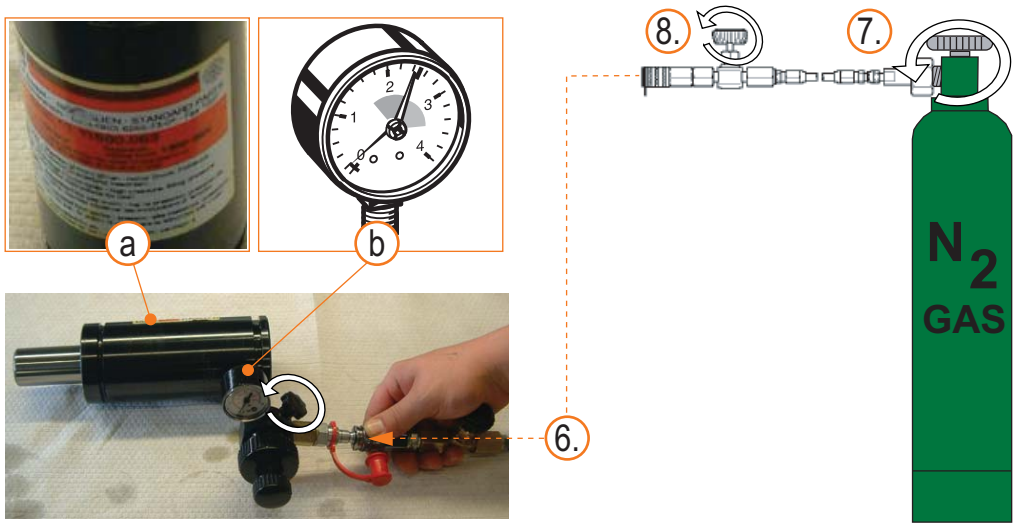


6. Fit bayonet catch of the filling hose onto the filling and control fitting.
7. Nitrogen bottle has to be opened at the turn knob of the bottle valve.

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.

8. 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.



9. After the filling pressure has been achieved close the shut-off valve at the filling hose.
10. Close nitrogen bottle at the control knob of the bottle valve.
11. Shut-off valve has to be opened slowly at filling hose.
12. 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.
13. Release and unscrew the threaded connection of the filling hose from the nitrogen bottle.
14. Remove filling hose at the bayonet catch from the filling and control fitting.
15. Unscrew filling and control fitting by turning the large turning knob from the filling adapter.
16. Filling adapter to be unscrewed.
17. Clamp gas spring in tilted position (approx. 30°) into vice. Piston rod slopes downwards.

⚠ WARNING Nitrogen escaping. Never bend over the valve of the gas pressure spring. Wear safety goggles. Risk of injury.

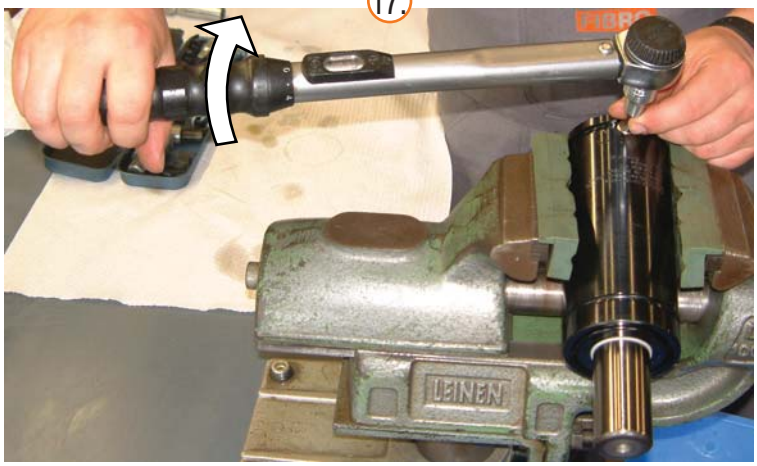
18. Check if nitrogen escape from the valve of the gas spring.

ⓘ If oxygen escapes, the valve needs to be replaced (removal see chapter 2.3.1 ; installation see chapter 2.3.3).

19. Blanking plug to be inserted into filling opening of the gas spring. Tighten with a torque of 2 Nm (1,5 lb-ft) for M6; 15 - 18 Nm (11-13 lb-ft) for G1/8".

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

17.



2.5 Personal notes

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