

## Instructions for use and assembly LDS



Made in Germany

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## 1 General

### 1.1 Notes on the operation and maintenance instructions

The structure of the content is based on the life phases of the heavy-duty shock absorber (hereinafter referred to as „device“). Weforma Dämpfungstechnik GmbH is referred to as „Weforma“ in the following.

The manufacturer reserves the right to make changes to the technical data given in these operation and maintenance instructions. They can deviate in individual cases from the respective design of the device, without the objective information being fundamentally changed and becoming invalid. The current status of the technical data can be requested from the manufacturer at any time. No claims can be derived from this. Deviations from text and images are possible and depend on the device's technical development, equipment and accessories. The manufacturer shall provide information about any deviating information regarding special designs with the sales documents. Other information is not affected by this.

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### 1.2 Standards and guidelines

The fundamental safety and health requirements of the respective laws, standards and guidelines have been applied in the design.

The safety is confirmed by the declaration of conformity (see sales documents). All information relating to safety in these operating and maintenance instructions refer to the laws and regulations currently valid in Germany. All information in these operating and maintenance instructions is to be adhered to unreservedly at all times. In addition to the safety instructions in these operation and maintenance guidelines, the regulations valid at the place of assignment regarding accident prevention, environmental protection and occupational safety must be noted and complied with. Regulations and standards for the safety assessment are to be found in the declaration of conformity.

### 1.3 Designated use

Heavy-duty shock absorbers of the LDS series are damping elements intended for installation in machines, systems and devices in which moved masses have to be cushioned.

Heavy-duty shock absorbers may only be used pursuant to the technical data.

Usage beyond the intended use of the shock absorber is deemed non-designated use and requires written approval from the manufacturer.

The operator is solely responsible for any damage arising from the non-designated use of the device.

The manufacturer assumes no liability for personal injury or damage to property caused by misuse or as the result of procedural errors, through improper transport, installation, removal, operation and improper maintenance and disposal.

The device may be operated by instructed and authorised specialist personnel only, in compliance with all safety instructions.

The safe and error-free use and the operational safety of the device are guaranteed only with designated use pursuant to the information in these operation and maintenance instructions.

Designated use includes the noting of and compliance with all safety instructions listed in these operation and maintenance instructions and all valid regulations of the Employers' Liability Insurance Associations ("Berufsgenossenschaften"), the valid laws regarding environmental protection and the prescribed operating regulations.

## 1.4 Foreseeable misuse

Foreseeable misuse is deemed to be any installation contrary to the designated purpose approved by the manufacturer.

The device may not be used as an ascending aid.

## 1.5 Warranty and liability

As a fundamental principle, the manufacturer's general terms and conditions of sale and delivery apply. The terms and conditions of sale and delivery are part of the sales documents and will be handed over to the operator on delivery. The warranty period when the device is used as intended is 12 months.

The device is designed based on the technical data indicated by the operator. Weforma is not responsible for errors or damage that result from faulty or missing technical data. In all cases, the operator is obligated to check the suitability of the device for his application himself.

The maintenance and repair may be done by Weforma or by authorised specialist enterprises only. Claims for liability in the event of personal injury or damage to property are excluded if they are attributable to one or more of the following causes:

- Opening of the device by the operator.
- Non-designated use of the device.

- Improper transportation, installation, removal, operation and improper maintenance and disposal of the device.
- Structural changes to the device without the written consent of the manufacturer.
- Operating the device with improperly installed connections, defective safety fittings or improperly attached safety and protection equipment.
- Non-compliance with the safety provisions and instructions in these operation and maintenance instructions.
- Exceeding the technical data indicated.



Only the current versions of our operation and installation instructions apply. These are available as downloads at [www.weforma.com](http://www.weforma.com) in the menu item “log-in/service”.

## 1.6 Customer service of the manufacturer

In the event of faults, the device may be repaired only by the manufacturer. The address of the customer service can be found on the rear cover page of this document.

If you have not purchased the device directly from Weforma, please contact the manufacturer of the machine or the supplier of the device.



At the request of the customer service, the information on the device (see type plate or imprint) is to be kept on hand.

## 2 Safety




### 2.1 General safety instructions

These operation and maintenance instructions contain all the safety instructions that must be complied with to avoid and avert any dangers when handling the device in the individual life cycles. If all the safety instructions listed are complied with, safe usage of the device is guaranteed.




#### Design of the safety instructions

The safety instructions in this document are marked by safety symbols and are designed according to the SAFE principle. They include information about the type and source of the risk, possible consequences and how to avert the risk.



The following table defines the depiction and description of danger levels that pose possible bodily injury, as these symbols are used in these operating and maintenance instructions.

Symbol	Signal word	Meaning
	DANGER	Warns of an accident that will occur if the instructions are not complied with and that can result in life-threatening, irreversible injuries or death.
	WARNING	Warns of an accident that will occur if the instructions are not complied with and that can result in serious, possibly life-threatening, irreversible injuries or death.
	CAUTION	Warns of an accident that will occur if the instructions are not followed and that can result in minor, reversible injuries.

The following table describes the pictograms used in these operating and maintenance instructions to depict the danger in conjunction with the symbol for the danger level.

Symbol	Meaning
	Not to be used as an ascending aid.
	Risk of crushing
	Protective helmet must be worn

The following table defines the depiction used in the operation and maintenance instructions and the description for situations in which damage can occur to the product, and it also points out important facts, states, tips and information.

Symbol	Signal word	Meaning
	<i>PLEASE NOTE</i>	This symbol warns of possible damage to property.
		This symbol indicates important facts and conditions and further information in these operation and maintenance instructions. It also refers to certain instructions that provide additional information or that help you to carry out a process more easily.

The following example depicts the content structure of a safety instruction:



## **DANGER**

Type and source of danger

Explanation of the type and source of the danger.

- Measures to avert the danger.

## 2.2 Signs

### **Type plate / imprint:**

Depending on the size of the device or the customer requirement, there is a type plate or lasered imprint on the device. The imprint consists of the name, product no. and year of construction.

On customer request further information can be added.

## 2.3 Safety principles

The device is constructed according to the state of the art and the recognised safety technology regulations and is operationally safe. The fundamental safety and health requirements of the respective laws, standards and guidelines have been applied in the design of the device. The safety of the device is confirmed by the declaration of conformity.

All information regarding safety refers to the currently valid regulations of the European Union. In other countries, the operator must ensure that the relevant laws and country regulations are complied with.

In addition to the safety instructions in these operation and maintenance guidelines, the generally valid regulations regarding accident prevention and environmental protection must be noted and complied with.

The device is to be used only in a technically fault-free condition and pursuant to the designated use, with due regard to safety and the possible risks, in compliance with these operation and maintenance instructions. The device is designed for use pursuant to Chapter 1.3 „Designated use“. With non-designated use, risks of injury and death for users or third parties and/or restrictions in the device and other material assets may arise. Accidents or near-accidents in the use of the device that resulted or would have resulted in injuries to persons and/or damage in the work environment must be reported to the manufacturer directly and immediately.

All safety instructions listed in the operation and maintenance instructions and on the device are to be complied with. The operator must also ensure that all national and international regulations valid in the respective country of assignment and other binding regulations regarding operational safety, accident prevention and environmental protection are complied with. All work on the device may be carried out only by trained and authorised personnel trained in the safety technology.

## 2.4 General obligations of the operator

- The operator must use the device only in a fault-free and operationally safe condition. He must ensure that, in addition to the safety instructions in the operation and maintenance instructions, the generally valid safety and accident prevention regulations and the provisions regarding environmental protection of the respective country of assignment are noted and complied with.
- The operator is responsible for ensuring that all work with the device is carried out only by trained and authorised personnel instructed in the safety technology.

- ❑ The operator of the device or the personnel authorised by the operator is ultimately responsible for accident-free operation.
- ❑ The operator must ensure that the maximum dynamic forces for which the device is designed are not exceeded.

**Non-compliance of the maximum dynamic forces and the calculated energy absorption per stroke can result in the loss of the damping function. If the maximum energy absorption used per stroke > 80%, an approval by Weforma is required!**

## 2.5 Requirements of the personnel

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- ❑ Each person tasked with working with the device must have read and understood the complete operation and maintenance instructions before they carry out the corresponding tasks. This also applies if the respective person has already worked with such a device or has been trained to work with it.
- ❑ All work with the device may be carried out only by trained and authorised personnel instructed in the safety technology. Before the start of all activities, the personnel must have been familiarised with the risks of handling the device.
- ❑ All persons may carry out tasks only in accordance with their qualification. The areas of responsibility of the respective personnel are to be clearly defined.
- ❑ No personnel tasked with working with the device may have any physical limitations that restrict their attention span and powers of judgement temporarily or permanently (e.g. through overtiring).
- ❑ The device may not be handled and no installation, removal and maintenance tasks may be carried out by minors or persons under the influence of alcohol, drugs or medication.
- ❑ In accordance with the tasks necessary and the current work conditions, the personnel must wear personal protective equipment.

## 2.6 Safety instructions with regard to the technical state

- ❑ After transportation, the device is to be checked for damage and proper condition.
- ❑ The operator must operate the device only in a fault-free and operationally safe condition. The technical state must correspond at all times to the statutory requirements.
- ❑ If dangers to persons or changes in the operating behaviour are detected, the device must be shut down immediately and the incident reported to the supervisor or operator.

- The device may be used only for the envisaged and designed energy absorption per stroke and pursuant to the technical data the design is based on.
- No changes, attachments or conversions may be made to the device without the manufacturer's approval.

## 2.7 Safety instructions regarding transport, installation and removal

As a fundamental principle, the respective transport company is responsible for the transport of the device. The following safety requirements are to be complied with during transport, installation and removal:

- During transport, the device is to be secured pursuant to the regulations of the transport aid used.
- Only lifting equipment and sling gear properly dimensioned to reliably absorb forces incurred during the loading, unloading and during the installation and removal of the device may be used for transport.
- If work is necessary under suspended parts or work equipment, these must be secured against falling with suitable gear. Work tools to lift loads must prevent the loads shifting unintentionally or falling freely or unintentionally being disengaged.
- It is forbidden to stand under suspended loads.
- Before installing or removing devices, the operator's safety specialist must be informed.  
The operator is responsible for determining the necessary safety requirements for the user.
- With an installation height of 2 m or more, a protective helmet is also to be worn.
- With an installation height of 2 m or more, a security chain must be used.
- As a fundamental principle, transport, installation and removal work may be done only by trained and instructed specialist personnel.

## 2.8 Safety instructions regarding operation

- The operator of the device is responsible for checking the safety and proper working condition of the device before it is first put into operation.
- This is also necessary during the operation of the device at the regular intervals to be defined by the operator.

## 2.9 Safety instructions regarding maintenance

- As a fundamental principle, maintenance tasks may be carried out only by trained and instructed specialist personnel and pursuant to these operation and maintenance guidelines.
- The maintenance intervals noted in these operation and maintenance guidelines are to be complied with.
- The device may not be cleaned with a high-pressure cleaner or steam blaster.

## 2.10 Safety instructions regarding disposal

- ❑ When disposing of device components, the laws and regulations valid locally are to be complied with. Please note that the recyclability and the ease of dismantling and separation of substances and sub-assemblies should be taken into account as much as the environmental and health risks during recycling and disposal.
- ❑ Operating materials and auxiliary substances are to be gathered in suitable containers and handed in to the respective disposal companies.



## 3.2 Design variants

### FH variant:

- Flange bonded at the back

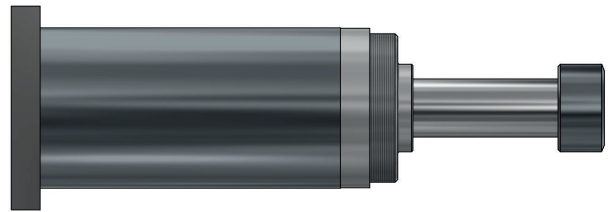


Abb. 2 View of a device of the LDS series of the FH variant

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### FV variant:

- Flange bonded at the front

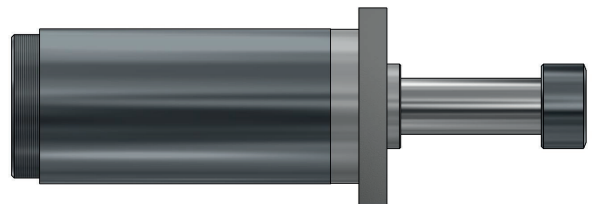


Abb. 3 View of a device of the LDS series of the FV variant

In the FV FH variant, the flange is bonded at the front and the flange screwed on at the back.

### FB variant:

- Flange on both sides (flange bonded at the front, flange screwed on at the back)

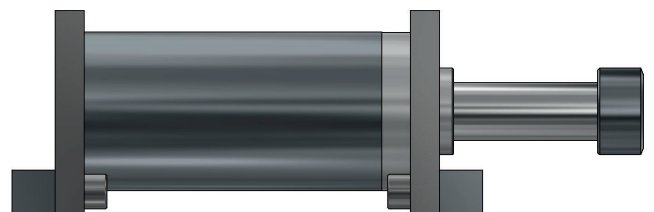
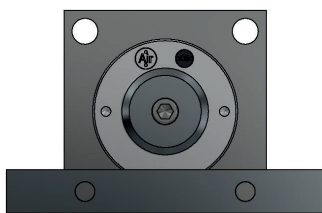


Abb. 4 View of a device of the LDS series of the FB variant

### DW variant:

- Piston on both sides / Flange on both sides (flange bonded at the front, flange screwed on at the back)



Abb. 5 View of a device of the LDS series of the DW variant

## Optional attachments:

- Proximity switch
- Security chain
- Stop cap
- Enlarged stop cap
- Metal wiper
- Swivel fixation
- Gaiter
- Reverse spring
- Trap pin / Trap funnel

## 3.3 Technical data



At the request of the customer service, the information on the device (see type plate or imprint) is to be kept on hand.

### Compilation of technical parameters

Technical data	LDS-25-050 up to LDS-160-1200
Piston diameter	25 mm up to 160 mm
Stroke length	50 mm bis 1800 mm
Energy absorption per stroke	1250 Nm bis 800 000 Nm
Weight	2,4 kg bis 505 kg
Temperature range of usage With permanent usage optional	Standard (ST): -20 °C up to +80 °C Permanent Usage (PU): -10 °C up to +70 °C HT-Version (ST): 0 °C up to +120 °C HT-Version (PU): 0 °C up to +110 °C LT-Version (ST): -32 °C up to +50 °C LT-Version (PU): -32 °C up to +50 °C LTT-Version (PU): -50 °C up to +50 °C LTT-Version (DE): -50 °C up to +50 °C
Oil type in normal temperature	SO-26
Gas	Nitrogen, optionally compressed air
Housing material	Standard: zinc-plated Maritime: varnished
Piston rod	Standard: hard-chrome plated Maritime: nickel-plated, hard-chrome plated

Tab. 1 Technical data



The precise technical data can be found in the sales documents and the type plate and/or imprint on the device.

## 4 Transport



### WARNING

Risk of injury from standing in the risk zone during transportation.

Risk of crushing.



- During transport, the device is to be secured pursuant to the regulations of the transport medium used.

- Only sufficiently dimensioned lifting equipment and sling gear may be used for the transport. The permissible bearing load may not be exceeded.



- When the loads are slung, the weight information is to be complied with.

- The load is to be sufficiently secured.

- With a slung load, any change in the weight distribution and the position of the centre of gravity is to be noted.

- The load must be slung in such a way that it cannot slip or fall out.

- No damaged or unchecked load receptacle may be used. The correct use of the load receptacles pursuant to the manufacturer's information is to be complied with.

- Loads may only be lifted vertically and never pulled diagonally. Swinging the load is to be avoided.

Deposit the loads securely immediately after transport.

- If work is necessary under suspended parts or work equipment, these must be secured against falling with suitable equipment. Work tools to lift loads must prevent the loads shifting unintentionally or falling freely or unintentionally being disengaged.

- Suspended loads may never be stood under.

- A protective helmet and safety shoes are to be worn when working with loading equipment.

- It is forbidden to transport persons with the load.



### PLEASE NOTE

Damage to the device and/or components of the device through improper transport

- Please ensure when lifting and lowering the device that the device or the piston rod are not damaged.

## 5 Installation/Removal



### WARNING

Risk of injury from standing in the risk zone during installation and removal.

Risk of crushing.



- Only instructed specialist personnel may carry out the installation and removal.
- Only sufficiently dimensioned lifting equipment and sling gear are to be used for the installation and removal. The permissible bearing load may not be exceeded.



- When the loads are slung, the weight information is to be complied with.
- With a slung load, a change in the weight distribution and the position of the centre of gravity are to be complied with.
- The load must be slung in such a way that it cannot slip or fall out.
- No damaged or unchecked load receptacle may be used. The correct use of the load receptacles pursuant to the manufacturer's information is to be complied with.
- Loads may only be lifted vertically and never pulled diagonally. Swinging the load is to be avoided. Deposit the loads securely immediately after transport.
- If work is necessary under suspended parts or work equipment, these must be secured against falling with suitable equipment. Work tools to lift loads must prevent the loads shifting unintentionally or falling freely or unintentionally being disengaged.
- Suspended loads may never be stood under.
- A protective helmet and safety shoes are to be worn when working with loading equipment.
- It is forbidden to transport persons with the load.



### WARNING

Risk of injury due to wrongly dimensioned receptacle or wrongly dimensioned fixation material.

Risk of persons being crushed or struck.

- Only use fixation material that matches the dimension of the receptacle.
- The counterpart receptacle (on the operator side) must be designed at least for the forces that the device was designed for.



### WARNING

Risk of injury through the loss of the support and holding function.

Risk of persons being crushed or struck.

- Please note static and dynamic loads.



### WARNING

Risk of injury through use of the device as an ascending aid.

Risk of falling.

- Do not use device as an ascending aid.



### CAUTION

Risk of injury due to weather influences.

Risk of freezing and burning of the skin.

- Wear personal protective equipment.

**PLEASE NOTE**

Damage of the device through improper installation or removal.

- Please ensure when installing and removing the device that the piston rod is not damaged.

**PLEASE NOTE**

Damage to the device through the piston rod being blocked.

- The piston path must be clear at all times.

**PLEASE NOTE**

Damage to the device through the loss of the support and holding function.

- Please note static and dynamic loads.



The device is manufactured according to the information ordered by you. The description can be found in the sales documents.

## 5.1 Preliminary conditions for installation

- The device is to be checked for damage after transport, in particular for damage to the chrome layer of the piston rod.
- Before installation, check that the product number in the order confirmation and on the delivery note tallies with that on the device.
- The installation and removal of the device must be carried out with sufficient support and securing with special tools. Lifting equipment and sling gear of sufficient dimensions should be used, in compliance with all safety measures.
- Before the start of the work, the personnel must note the work height and accordingly define a secure technological process, in compliance with all safety measures.
- Wearing of personal protective equipment required in accordance with the tasks (occupational safety protective suit, protective gloves, protective helmet, etc.).
- Selection of the securing measures necessary for the work, if necessary clearance of the site.
- When removing the device, lower it safely and place it in a secure site.

## 5.2 Installation

The following installation measures must be complied with.

- The devices must be completely secured with the accessories specified in the order. If no accessories were ordered, the device must in any case be secured at the bottom of the device with a counter support that is capable of absorbing the entire forces.
- Rigid and vibration-free fixation of the shock absorbers.
- Impact area must be arranged at a right angle to the stop cap and/or the fixation flange.

- Mass must impact parallel to the damping direction and in the centre of the stop cap/piston rod (see angle deviation in the data sheets).
- Fixation screws may not be more than 2 mm smaller than the envisaged fixation bores.
- Suitable fixing materials must be used in accordance with the dimensioning data.
- Device must not be tensioned as this can result in a blocking of the piston rod.
- The stitch size can be adjusted through the rear flange. Max. Deviation: +1 mm from catalogue dimension.
- Check: It must be possible to remove the device without tools after loosening the fastening screws.
- The piston rod is to be protected against damage.
- With a stroke of 300 mm or more, a device with flange fixation at the front is to be used.
- With 800 mm or more of stroke, mount device on both sides with foot fixation and/or flanges.
- With an installation height of 2 mm, a security chain is to be used.
- Mount the device according to figure 1 to enable refilling with gas. The protective caps for gas and oil filling must be above the piston rod.
- Stationary installation is recommended for low-temperature applications down to -32 °C. If the device is installed on mobile components, there may be leakages on the damper due to transmission of oscillations.
- Before the function test, use a valve extension to check that there have been no function-impairing problems during transport. To do this, screw the valve extension onto the valve behind the air cap and press briefly (0.5 s). If a few drops of oil come out, the function test can be carried out.
- The check of the correct installation steps, the check with the valve extension, incl. the performance of a function test are to be documented by the customer.



*Valve extension*

A valve extension can be ordered as an accessory under LDS-31V.

When installing the device, the possible combinations of accessories must be taken into account. The combinations marked in red are not possible at max. load.

Series	FV	FH	FV FH	FB	FV FBH	FBH FH	Sonder FB
LDS 25	✓	✓	✓	✓	✓	✓	✓
LDS 32	✓	✓	✓	✓	✓	✓	✓
LDS 40	✓	✓	✓	✓	✓	✓	✓
LDS 50	✓	✓	✓	✓	✓	✓	✓
LDS 75	✗	✓	✓	✗	✓	✓	✓
LDS 80	✗	✓	✓	✓	✓	✓	✓
LDS 100	✓	✓	✓	✓	✓	✓	✓
LDS 125	✗	✓	✓	✓	✓	✓	✓
LDS 160	✗	✓	✓	✓	✓	✓	✓

FV = Flange, front

FH = Flange, rear

FB = Foot mounting; FBH = Foot mounting, rear; FBV = Foot mounting, front

### 5.3 Removal

- Secure the system mechanically before removing the device.
- Device may not be disconnected forcibly from the system.

## 6 Operation



### **WARNING**

Risk of injury to persons standing in the area of the device during operation.

Risk of persons being crushed or limbs being amputated.

- Safety distance from moving parts must be maintained. The safety distance must be determined by the operator depending on the application.



### **PLEASE NOTE**

Damage to the device as the result of wrong operation.

- In normal operations (max. 0.5 m/s), a maximum of 80% of the stroke must be retracted.
- In creep mode a maximum of 90% of the stroke can be retracted.

## 7 Maintenance



### WARNING

Risk of injury if you are standing in the risk zone during maintenance.

Risk of crushing.



- The maintenance may be carried out by instructed specialist personnel only.
- Only sufficiently dimensioned lifting equipment and sling gear may be used for the maintenance. The permissible bearing load may not be exceeded.



- When the loads are slung, the weight information is to be complied with.
- With a slung load, a change in the weight distribution and the position of the centre of gravity are to be noted.
- The load must be slung in such a way that it cannot slip or fall out.
- No damaged or unchecked load receptacle may be used. The correct use of the load receptacles pursuant to the manufacturer's information is to be complied with.
- Loads may only be lifted vertically and never pulled diagonally. Swinging the load is to be avoided. Deposit the loads securely immediately after transport.
- If work is necessary under suspended parts or work equipment, these must be secured against falling with suitable equipment. Work tools to lift loads must prevent the loads shifting unintentionally or falling freely or unintentionally being disengaged.
- Suspended loads may never be stood under.
- A protective helmet and safety shoes are to be worn when working with loading equipment.
- No persons may be transported with the load.

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### WARNING

Risk of injury to persons standing in the area of the device when the maintenance is carried out.

Persons may be crushed or struck.

- Access to and handling of the device by authorised and trained specialist personnel only.
- Note dynamic loads on impact with the device.



### WARNING

Risk of injury through falling parts.

Persons may be knocked or struck.

- Access to and handling of the device by authorised and trained specialist personnel only.
- Prevent parts that unintentionally loosen themselves by catching onto gear from falling.



### WARNING

Risk of injury through use of the device as an ascending aid.

Risk of falling.

- Do not use device as an ascending aid.



### CAUTION

Risk of injury due to the device becoming hot.

Burning of the hands possible.

- Access to and handling of the device by authorised and trained specialist personnel only.
- Use of personal protective equipment.
- Let the device cool down before starting the maintenance tasks.



## PLEASE NOTE

Damage to the device through improper maintenance.

- If errors or defects on the shock absorbers are corrected by the device operator, written approval from Weforma is to be obtained beforehand.
- Weforma assumes no liability for damage or malfunctions of the damper if these are repaired by the customer.
- In the event of leakages (oil discharge), the device must be checked and repaired by Weforma

## 7.1 Maintenance intervals

	After the device is put into operation	Every 6 months	Every year	After 8 years or 250,000 load cycles or 400 km*	After 12 years or 375,000 load cycles	After an emergency
<b>Activity</b>	<b>Maintenance intervals</b>					
Inspection of the device (Chapter 7.2)	•	•				
Checking functionality of the device (Chapter 7.3)	•	•				
Inspection and functional check of the emergency dampers (Chapter 7.4)	•	•	•			•
Replacement of wear parts				•		
Replacement of the device**					•	

Tab. 2 Maintenance intervals

\* With a stroke of 800 mm, 1 load cycle corresponds to 1600 mm.

\*\* Weforma points out that the damper has reached the end of its service life after 12 years or 375,000 load cycles. Any further use is at the operator's own risk. Weforma accepts no liability for damage resulting from continued operation.

## 7.2 Inspecting the device

Inspect:

- leakages in the piston rod
- leakages on the housing base
- damage to piston rod
- damage to the housing
- proper fixation

## 7.3 Checking functionality of the device

1. Press in the piston rod by hand or via the system.
  - ✓ The piston rod must re-emerge automatically after release.
2. Remove the air cap, screw on the valve extension (accessory) and press for a short time (max. 0.5 s). If oil drops are visible, the system is ready for use. Mount the air cap.

## Refilling the gas



### WARNING

Risk of suffocation through uncontrolled discharge of nitrogen.

Risk of irreversible injury or death

- Gas may be refilled only by Weforma or specialist firms authorised for these tasks.
- Refill nitrogen only in well-ventilated spaces.



### CAUTION only with use of liquid nitrogen

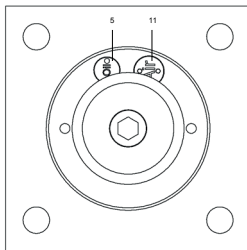
Risk of freezing through uncontrolled nitrogen release.

Risk of injuring during gas refilling.

- Personal protective equipment must be worn.
- Gas may be refilled only by Weforma or specialist forms authorised for these tasks.

GB

If the piston rod does not re-emerge automatically, check gas pressure in the shock absorber and/or refill. The filling valve for gas (11) is labelled with the label „AIR“ (see Fig. 1). It is located in the seal bushing (4) on the front flange fixation, and with older versions in the housing base.



1. The filling valve (11) in the seal bushing (4) must point upwards before opening.
2. Remove screw cap.
3. Screw/place adapter onto the filling valve.
4. Fill shock absorber with nitrogen (if necessary with compressed air). Fill pressure: 6 bar (85 psi)  
If fill pressure is reached, pull adapter off filling valve. Nitrogen is recommended for deep-freeze is recommended, as otherwise shorter maintenance intervals are necessary.
5. Screw cap on until stop.
  - ✓ The piston rod will be fully extended after filling.

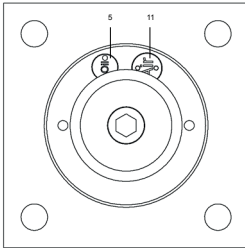
If the piston rod is not extended after filling with gas, please contact Weforma.



An adapter can be ordered as an accessory under the parts number LDS-31V.

## Refill oil

The oil cap screw (5) is located in the seal bushing (4) on the front flange fixation (see Fig. 6).



1. Attention Before opening the oil screw cap, the gas must be released and the piston rod must be secured against retracting by itself!  
The oil screw cap must point upwards before refilling.
2. Open oil cap screw (5). Fully extend piston rod.
3. Refill oil of the type SO-26 (at normal temperature) or SO-19 (at low temperature).



The precise quantity of oil and information on the type of oil can be requested from Weforma.

4. Close oil screw cap.
5. Check filling valve for tightness.
6. Fill with nitrogen.

## 7.4 Inspection and functional check of the emergency dampers

The emergency damper is activated only in emergencies. With emergency dampers, the inspection and functional check is to be carried out after every emergency or once a year.

### Carry out a functional check of the emergency damper:

1. Retract the piston rod in creep mode (retraction of the damper with a maximum of 0.5 m/s).
  - ✓ After release, the piston rod must return to its initial position automatically.

## 8 Storage/disposal

With all work on and with the device, the respective statutory obligations to avoid waste and proper recycling/disposal are to be complied with.

### 8.1 Storing the device with operating materials



#### **PLEASE NOTE**

Device may be damaged by improper storage.

- Storage temperature must be between 0 °C to +25 °C.
- Avoid high humidity levels.

- Clean housing and the external components, close oil screw cap tightly.
- Pack device in suitable storage container (wooden crate) and store in a dry and secure place.
- For the duration of the storage, check the device regularly for leak points and/or discernible damage and if necessary have these corrected by correspondingly authorised specialist personnel.

### 8.2 Scrapping

When scrapping the device, the international, national and regionally-specific laws and regulations then valid are to be complied with.



Please note that material recyclability and the ease of dismantling and separation of substances and sub-assemblies should be taken into account as much as the environmental and health risks during recycling and disposal.

Dismantle device (see Chapter 5 „Installation/Removal“ and Chapter 7.5 „Dismantling device“). Material groups, like plastics and metals of varying kinds, are to be sorted and fed into the recycling or disposal process. Dispose of the oil collected from the device as hazardous waste.

### 8.3 Hazardous waste

Hazardous waste offers a high potential for risk for man and the environment and is subject to special statutory provisions. Hazardous waste includes:

- All used operating materials, lubricants and auxiliary agents.
- All collection tanks and their drainages and feed-ins.

## 9 Appendices

### 9.1 Dismantling device



#### **WARNING**

Risk of injury from the sudden release of the gas contained in the shock absorber.

Risk of irreversible injury or death.

- Maintenance and repair may be done only by Weforma or by authorised specialist enterprises.
- Open filling valve screw cap before start of maintenance and servicing and release complete pressure.



#### **WARNING**

Erstickungsgefahr durch unkontrolliert austretenden Stickstoff.

Irreversible Verletzung und Todesfolge von Personen möglich.

- Die Instandhaltung und Reparatur darf ausschließlich von Weforma oder von für diese Arbeiten autorisierten Fachbetrieben erfolgen.
- Stickstoff nur in gut belüfteten Räumen und in kontrollierten Mengen ablassen.



#### **CAUTION only with use of liquid nitrogen**

Risk of freezing through uncontrolled nitrogen release.

Risk of injury when the device is opened.

- Personal protective equipment must be worn.
- Maintenance and repair may only be done by Weforma or by authorised specialist enterprises.



#### **PLEASE NOTE**

Damage to the piston rod if dismantled improperly.

- Please ensure when dismantling that the piston rod is not damaged.

When dismantled, the device must be sufficiently supported and secured with special tools if necessary. Lifting equipment and sling gear of sufficient dimensions should be used, in compliance with all safety measures.

#### **Preliminary conditions**

- Wearing of personal protective equipment required in accordance with the tasks (occupational safety protective suit, protective gloves, protective helmet, etc.).
- Selection of the securing measures necessary for the work, if necessary clearance of the site.
- Fix the device securely to dismantle it.
- When dismantling the device, take the individual parts down carefully and place them in a secure site.

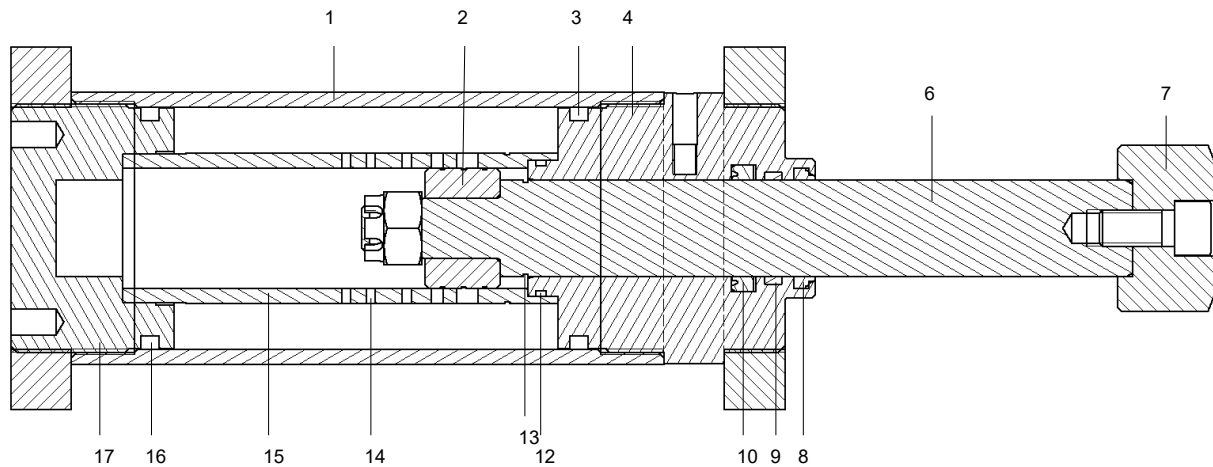
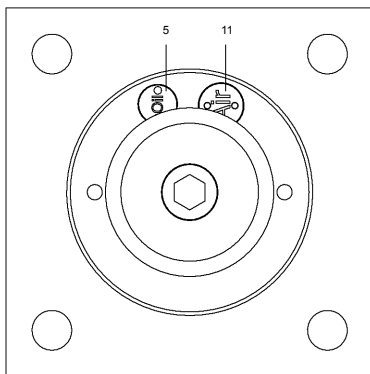


Abb. 6 Cross-section of a device from the LDS series



1	Housing
2	Piston
3	O-Ring (Seal bushing)
4	Seal bushing
5	Oil cap screw
6	Piston rod
7	Stop cap
8	Wiper
9	Guide tape
10	Lip ring seal
11	Filling valve
12	O-Ring (Seal bushing)
13	Securing ring Clamping ring
14	Return bores
15	Pressure tube
16	O-Ring Threaded element
17	Threaded element

1. Open the screw cap of the filling valve (11) and release complete pressure from the housing. Press in the piston rod (6) by hand or by the system. Piston rod must move easily.



## PLEASE NOTE

Damage to the device if improperly dismantled.

- If the piston rod is blocked, the device may not be dismantled by the operator. Please send the damper to Weforma for examination.
  - The device may be dismantled only by Weforma or specialist firms authorised for these tasks.
2. If necessary, dismantle fixation elements.
  3. Place damper vertically.
  4. Dismantle seal bushing (4). The seal bushing is secured with Loctite 270.
  5. Slowly pull seal bushing (4), piston rod (6) and piston (2) out of the housing.
  6. Remove oil from the device and catch in a suitable container.
  7. Dismantle base (17) with pressure tube (15).
  8. Dismantle stop cap (7) from the piston rod (6).
  9. Push the piston rod (6) with the piston (2) out of the seal bushing (4).
  10. Remove the following parts from the seal bushing: O-ring (3), wiper (8), piston rod seal (10) and O-ring (12)
  11. If necessary, remove guide tape (9).
  12. Dismantle O-ring (16) from the base.

## Version with return spring

With the version with return spring, the following steps must be taken before dismantling the seal bushing (see 4th point):

1. Press in the return spring in the direction of the housing.



## WARNING

Risk of injury through compression-loaded return spring.

Risk of irreversible injury and death

- Release spring slowly.
2. Release fixation screw of the stop cap (7). The fixation screw is secured with Loctite 270.
  3. Release spring slowly and take it from the piston rod.

## 9.2 Assembling the device



## CAUTION

Risk of skin irritations and sensitisation.

Risk of injuries when handling Loctite 270.

- Personal protective equipment to be worn.
- Maintenance and repair may only be done by Weforma or by authorised specialist enterprises.
- Comply with the safety data sheet.

Once assembled, the device must be sufficiently supported and secured with special tools if necessary. Lifting equipment and sling gear of sufficient dimensions should be used, in compliance with all safety measures.

## Preliminary conditions

- Wearing of personal protective equipment required in accordance with the tasks (occupational safety protective suit, protective gloves, protective helmet, etc.).
- Selection of the securing measures necessary for the work, if necessary clearance of the site.
- Fix the device securely when assembling it. The individual parts must be put in a secure site.

When assembling the device, take care not to damage the piston rod, seal bushing, piston rod seals and filling valve. All seals and O-rings are to be used with installation grease or damper oil.

All parts are to be cleaned carefully before assembly. All seals, wipers, O-rings and worn or damaged components must be replaced.

1. Insert guide tape (9), piston rod seal (10), wiper (8), O-ring (10) and (12) into the seal bushing (4) (see Fig. 6).
2. Insert piston rod (6) into the seal bushing (4).
3. Screw base (17) with O-ring (16) and pressure tube (15) into the housing (1). The thread must protrude 20 mm. Secure thread with Loctite 270.
4. Position housing (1) with the mounted parts perpendicular.
5. Fill pressure tube (15) with oil up to the highest return bore (14).
6. Move piston rod (6) against securing ring (13).



### **PLEASE NOTE**

Damage to the device if piston rod positioned wrongly during assembly.

- The piston rod (6) must remain extended when the device is screwed in!

7. Screw seal bushing (4) with piston rod (6) and piston ring (2) into the housing (1). The thread must protrude 20 mm. Secure thread of the seal bushing with Loctite 270.
8. Mount stop cap (7) on piston rod (6). Secure the fixation screw with Loctite 270.
9. Fill device with nitrogen or compressed air (see „Refill gas“).
10. Press in piston rod (6) and check whether it re-extends fully.
11. Check the tightness of the seal bushing (4), of the base (17) and of the filling valve (11) with leak spray.
12. If necessary, mount fixation elements and secure with Loctite 270.

**Errors and technical modifications reserved.**

