JDN AIR HOISTS

MINI 125 // MINI 250 // MINI 500 // MINI 1000

// INSTALLATION AND OPERATION MANUAL

J·D·NEUHAUS
1745
engineered for extremes

CONTENTS

1 GENERAL

1.1 About these operating instructions

These operating instructions should make it easy for you to get to know your hoist and to take advantage of the intended application possibilities.
These operating instructions contain important information to be able to operate your hoist safely, properly and efficiently. Your observance helps to avoid dangers, reduced repair costs and downtimes and to achieve the specified service life of the product.

1.1.1 Symbols and notations used

Safety instructions are classified in four stages in these operating instructions:

⚠ **DANGER**
Indicates an imminently hazardous situation that will result in death or serious injury if not avoided.

⚠ **WARNING**
Indicates a possibly hazardous situation that may result in death or serious injury if not avoided.

⚠ **CAUTION**
Indicates a potentially hazardous situation that may result in minor or moderate injury if not avoided.

NOTICE
Indicates a potentially hazardous situation that may lead to property and environmental damage if not avoided.

Different bullet points are used for the following cases:

- ➢ Instructions for behaviour
- 1) Instructions for behaviour with specified sequence
- • Listings without specified sequence
- → Reference to other sections in these operation instructions or applicable documents

1.2 Copyright protection

All rights reserved by the manufacturer. Neither the operating instructions as a whole nor individual sections may be reproduced, distributed or processed using electronic systems in any form without written permission from J.D. Neuhaus GmbH & Co. KG.
All of the brands mentioned in these operating instructions are the property of their respective manufacturers and are hereby acknowledged.

1.3 Contact data

If you have questions about handling your hoist that are not answered in these operating instructions, please contact

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D-58455 Witten-Heven

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1.4 Limitation of liability

All information and instructions in this manual were compiled in accordance with the applicable standards and regulations, current technological standards as well as many years of experience.

J.D. Neuhaus GmbH & Co. KG assumes no liability for damage due to:

- Non-observance of the instructions
- Inappropriate use
- Use by untrained personnel
- Unauthorised conversions
- Technical changes
- Use of unauthorised spare parts

1.5 Further documents

In addition to these operating and assembly instructions, the following documents may be part of the hoist documentation:

- Declaration of conformity, declaration of incorporation
- Factory certificate, chain and hook certificate
- Spare parts lists (English)
- Inspection log for the hoist: This can be used to document the results of periodic inspections and the replacement of components or assemblies (German/English).

1.6 Definition of terms

Operating company:
The operating company is defined as the company which has the actual or legal means to take the necessary decisions with regard to the safety of the hoist. The operating company bears the responsibility and at the same time is liable in the event of damage due to non-compliance with a regulation.
(Operating company obligations → section 2.2, page 4)

Operator:
The operator has been instructed by the operating company to operate the hoist.
(Qualification of personnel → section 2.1, page 4)

1.7 CE marking

The hoist is marked with CE . This marking indicates compliance with one or more EU/EG directives. In such cases, a declaration of conformity is supplied with the hoist. This declaration is not part of these operating instructions but is supplied separately. A document reproducing the contents of this declaration can be found in the appendix.

Machinery Directive 2006/42/EC
The JDN mini hoist is supplied either ready for operation as a complete machine or as an incomplete machine according to the Machinery Directive 2006/42/EC. For a complete machine that is ready for operation, an EC declaration of conformity is issued for the delivery condition; for an incomplete machine, a declaration of incorporation is issued. The completed hoist must then be checked for conformity with the Machinery Directive and a declaration of conformity issued.
If a complete hoist ready for operation is installed in a higher order machine in accordance with Machinery Directive 2006/42/EC, the new risks arising from the installation must be reassessed by the machine manufacturer and conformity must be determined again.
Likewise, in the case of unauthorised modifications to a complete hoist, a check of conformity with the Machinery Directive must be carried out and a declaration of conformity issued.

ATEX Directive 2014/34/EU
The JDN mini hoist when delivered complies as standard with the ATEX Directive 2014/34/EU in the classification listed in section 3.5, page 11. If the condition of the hoist supplied by JDN is modified or extended, conformity with the ATEX Directive must be checked and declared again.

2 SAFETY INFORMATION

Your hoist is built according to current technological standards and the recognised technical safety regulations. Nevertheless, dangers to life and limb of the user or third parties or impairments to their product and other property may result if the safety rules are disregarded during the product's use.

2.1 Qualification of personnel

The personnel responsible for operation, maintenance, inspection and set-up work must be competent or be instructed by a competent person before beginning work.
Due to their technical training and experience, properly trained personnel have adequate knowledge of pneumatic hoists. They are familiar with the relevant health and safety regulations, explosion protection regulations as well as accident prevention regulations to the extent that they can assess the safe working condition of your product.

- Observe the operating instructions for your workplace.
- Comply with the accident prevention regulations and explosion protection regulations.
- Receive instruction on dealing with hazardous materials.
- Follow the operating instructions in their entirety and in particular this Chapter 2 and the warnings in the "Operation" section.

2.2 Operating company obligations

The operating company of the hoist is obliged to ensure a safe and hazard-free operation. This also includes the necessary training/instruction of the operating personnel.

Within the Federal Republic of Germany the operating company is obliged, among other things, to observe accident prevention regulations and rules of the employers' liability insurance association, relevant explosion protection regulations and state occupational health and safety regulations, in particular

- DGUV regulation 1 – Principles of prevention
- DGUV regulation 54 – Winches, lifting and pulling equipment
- DGUV principle 309-001 – Inspection of cranes
- DGUV regulation 113-001 – Explosion protection regulations
- TRGS 727 – Preventing ignition hazards due to electrostatic charges

in the respective, currently applicable versions and initiate the specified, related tests.

In other countries, the corresponding national regulations on work safety, explosion protection and health protection are to be observed.

In exceptional cases of use, special regulations may apply.

In addition, the operating company must take at least the following measures, among others, to ensure safe and hazard-free operation:

- providing operating instructions on site at all times
- drafting work instructions, operating safety instructions and hazard assessments
- carrying out regular training sessions
- carrying out initial commissioning and periodic inspections, and keeping the inspection log
- regularly checking personnel work in a safety and hazard-conscious manner.

If a load is lifted together by several hoists / cranes, the work sequence must be determined beforehand by the operating company and monitored by a supervisor.

2.3 Proper use

The hoist is designed for lifting and lowering loads in the range of the rated load capacity with a vertically arranged chain.
In combination with a JDN trolley, the hoist is also suitable for overhead horizontal movement of loads.

Proper use also includes the observance of the operating conditions and the entire operating instructions and compliance with the inspection and maintenance conditions.
Any other or exceeding use is considered improper. J.D. Neuhaus GmbH & Co. KG assumes no liability for damage resulting from this improper use. The risk is borne solely by the user. Please observe the following national legal provisions.

2.4 Improper use

The following are regarded as improper use:

- Changing load capacities with the load position: Your hoist is not equipped with a load capacity display, which is why it may only be used in such cases where the load capacity does not change with the load position.
- Exceeding the load capacity
- Trying to dislodge stuck loads
- Loading of the hook at the tip
- Catching falling loads
- Carrying people
- Holding stationary loads above persons
- Jog controls
- For ongoing motion, switch in the opposite direction
- In the upper or lower limit position of the load hook, keep the chain taught in the area of the central part
- Transport of changing masses
- Transport of molten masses
- Transport over pipelines carrying dangerous substances
- Use outside of the operating conditions
- Use in explosion hazardous areas outside the permissible classification
- Operation after expiration of theoretical service life (service life)
- Starting the lowering limiter under normal operating conditions
- Use of the hoist as sling gear
- Oblique pulling (→ section 2.5, page 5).

Your hoist may not be used in the following areas:

- critical areas in nuclear plants
- over acid baths or systems with aggressive substances
- in areas where there are organic acids
- in areas outside of the permissible ambient temperatures

2.5 Oblique pulling

Oblique pulling is the deviation from the vertical position of the load chain and the chain hoist in the straight course of the force line between the point of application of force of the load on the load hook and the suspension on the carrying structure ($\alpha \neq 0°$).

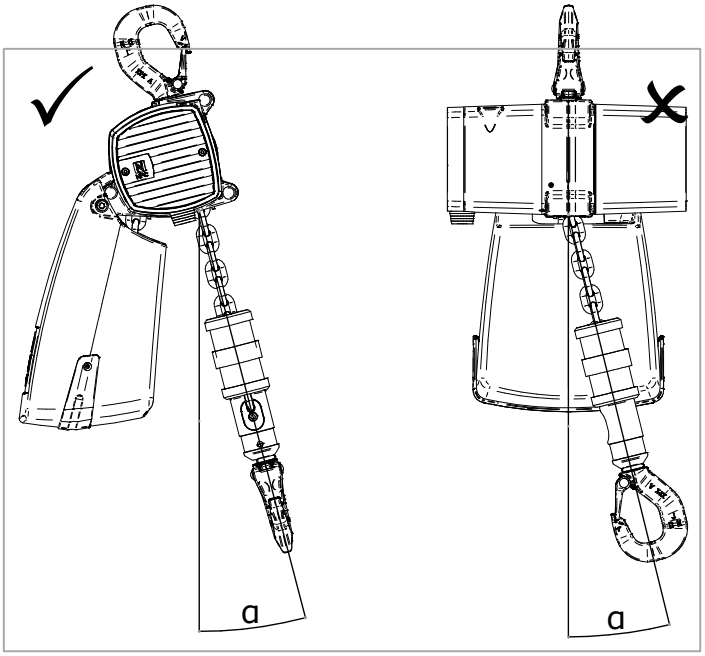


Fig. 1: Oblique pulling

Oblique pulling is permitted in exceptional cases under the following conditions:

- The hoist must be hung stationary, it must not be in any trolley.
- The hoist must be able to align itself freely in all directions under load, rigid suspension is not permitted.
- The hooks must not be loaded at the tip.
- If the angle of inclination is too large, the chain box must be removed, otherwise the chain may fall next to the chain box (section 3.2.3, page 8).
- The suspension must be suitable for the transverse forces that occur.
- If several hoists are used to lift a common load, the increase in load on the hoist and its suspension due to the spread angle must be taken into account.
- Shorten the maintenance intervals.
- Observe the specifications in the complete operating instructions.
- Contact J.D. Neuhaus if you have any questions!

2.6 Personal protective equipment

The protective equipment required for the operation, maintenance and inspection of the hoist is determined by the operating company's risk assessment. As manufacturer we recommend the following protective equipment:

- Safety helmet in the danger area
- Safety footwear
- Hearing protection for continuous use
- Tight-fitting work clothing

2.7 Spare parts

Only use **original JDN spare parts**. J.D. Neuhaus GmbH & Co. KG accepts no liability for the use of non-original components and/or modifications by unauthorised persons.

3 TECHNICAL DESCRIPTION

3.1 Marking / identification

For accurate identification you will find a nameplate on your hoist containing all relevant information (→Fig. 2: Nameplate).

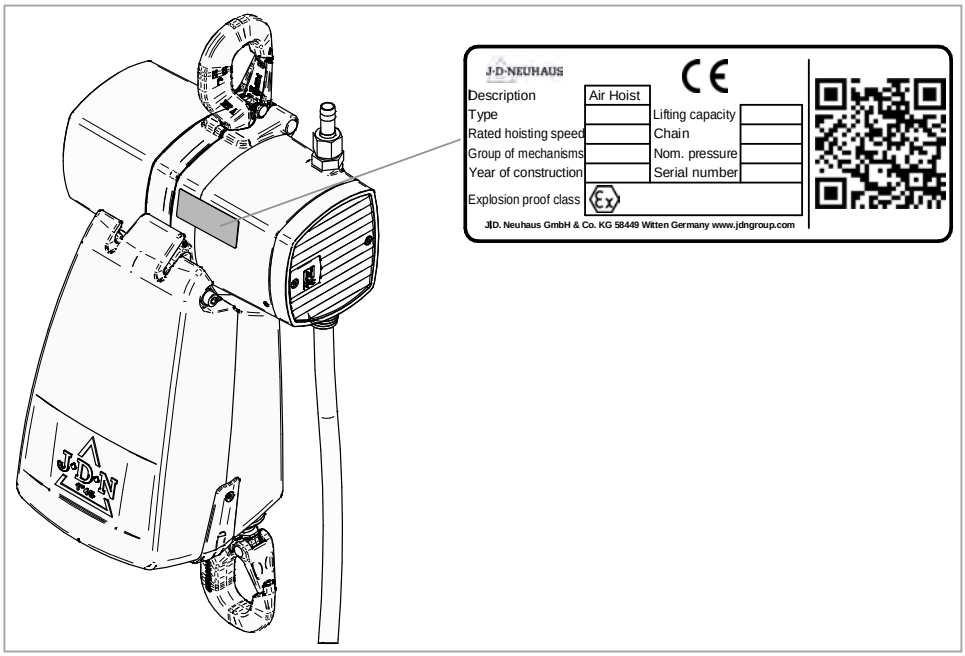


Fig. 2: Nameplate

3.2 Assembly overview

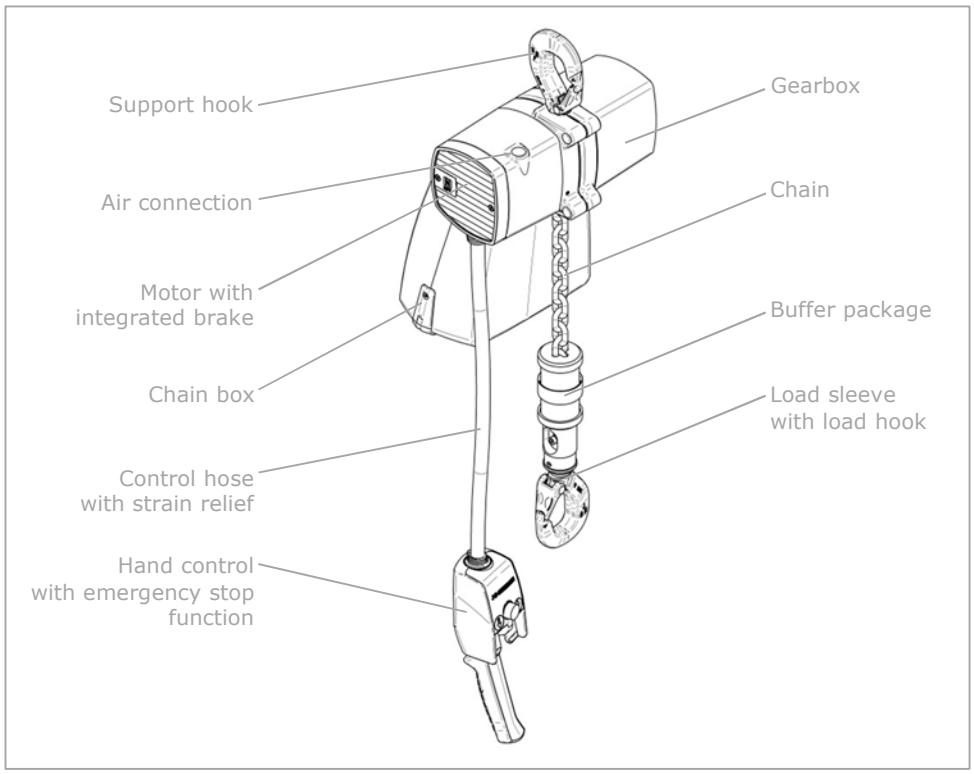


Fig. 3: Assembly overview

3.2.1 Motor with integrated brake

The pneumatic motor is designed as a vane motor with integrated brake.

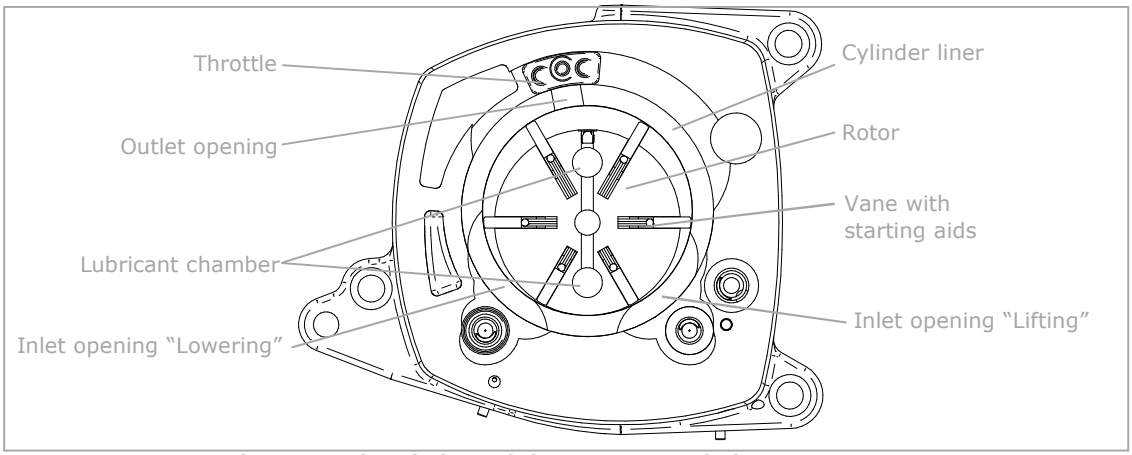


Fig. 4: Sectional view of the compressed air vane motor

The vane motor consists of a cylinder liner with two lateral bearing washers and an inner rotor. The bearing washers are spring preloaded and also serve as brake discs. The rotor is mounted eccentrically in the cylinder liner and is provided with slots for installation of the vanes. The vanes can move freely and make contact with the inner wall of the cylinder liner. Each chamber is formed by two vanes.
Due to the incoming compressed air, a greater force is created at the leading, larger vane surface than at the trailing, smaller vane surface. The rotor's torque results from the difference in force. As the chamber passes the outlet opening, the compressed air can escape. A throttle is located at the outlet opening with which a maximum speed can be set (section 5.7, page 18). There are two connected lubricant chambers in the rotor. Continuous motor lubrication takes place via permeable discs embedded in the rotor at the front. The lubricant chamber can easily be refilled from the outside via a grease nipple (section 7.3.3, page 29).

3.2.2 Gearbox

The gearbox is designed as a two-stage planetary gearbox. The mini 250 and mini 1000 have one double stage each.

3.2.3 Hook, chain and chain container

Hook:

NOTICE
Load hooks/support hooks must not be loaded at the tip. They may not be directed or annealed. This may result in damage to the hook.

The hoist is equipped with either a hook with a safety catch or a hook with a twist lock safety device. The different hook types are interchangeable.
The permissible temperature range of the load hook is -20°C (-4°F) to +150°C (302°F).

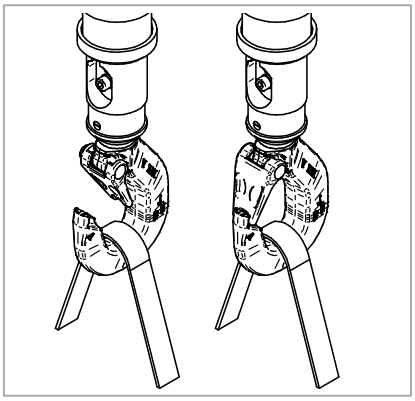


Fig. 5: Hook with safety catch

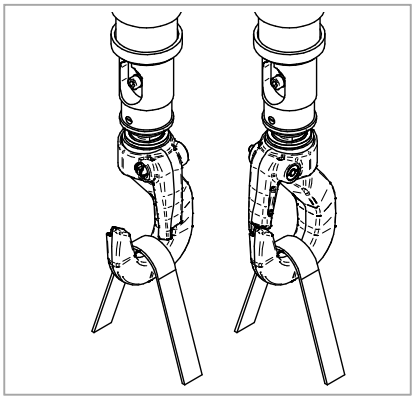


Fig. 6: Hook with twist lock safety device

Chain and chain inlet:

⚠ WARNING

Danger from chain fracture
The fatigue strength of chains is significantly impaired by extreme corrosion (pitting corrosion). In addition, rusty chains result in heavy wear. There is a danger of breakage!
Hydrogen-induced embrittlement with subsequent stress corrosion from highly corrosive media (e.g. sea water) may appear on high-strength alloys (e.g. on the chain). There is a danger of breakage! So-called recombination toxins promote this process. Hydrogen sulphides, cyanide, arsenic compounds and thiocyanates are known for this.

- Protect the chain against strong corrosion
- Do not use rusty chains

NOTICE

Chains from JDN are matched to the chain sprocket in close tolerances. In order to ensure an optimum function of the chain and in order to prevent risks, only genuine JDN chains may be installed. Do not use chains measuring 4mm x 12mm, 5mm x 15mm (mini 125/250) or 7mm x 21mm (mini 500/1000)!

The hoist is designed as a single chain hoist and has a chain size of 4.7mm x 14.1mm (mini 125/250) or 7.4mm x 22.0mm (mini 500/1000).
The chain is manufactured in accordance with DIN EN 818-7 and corresponds to DAT quality (standard chain) or quality 6 (stainless chain). The permissible temperature range of the chain is -20°C (-4°F) to +150°C (302°F).
The chain inlet on the load and idle chain side is equipped with replaceable wear parts (→Checking the chain inlets, page 32).

Chain container:

⚠ WARNING

Danger from falling chain
When operating without a chain container, it is important to ensure that the idle chain (unloaded chain end) accumulating on or sagging from the sprocket does not cause any hazard, such as from catching, impacting or falling. There may be hazards from the chain falling if the idle chain is first deposited on a load with a large surface or on-site occurrences when lifting and then slides off and drops.
When operating with other chain boxes or overfilled chain containers, the chain may fall out of the chain box.

- When operating without a chain container, ensure that the chain does not get caught, hit anything or fall down.
- Only use original JDN chain boxes.
- When replacing the chain (section 7.5.1, page 30), do not insert a longer chain than the original chain so as not to exceed the capacity of the chain box.

3.2.4 Control with emergency stop device

The lifting and lowering motion is controlled via the push buttons. In the process, the control pressure is continuously adjustable so that a sensitive positioning of the load is possible. The direction of movement of the load hook is indicated by arrows on the hand control.

- Lifting: Gently push down the right push button. The load will be lifted slowly.
- Depress the push button further to increase the lifting speed.
- Ease up on the push button slightly to reduce the lifting speed.
- Lowering: Gently depress the left push button. The load will be lowered slowly.
- Depress the push button further to increase the lowering speed.
- Ease up on the push button slightly to reduce the lowering speed.

The push buttons automatically return to the neutral position when released. All movements are stopped instantaneously and the load is securely held in its current position.

By pressing the red EMERGENCY STOP button, a separate blocking valve closes; the hoist instantly comes to a halt and the load is held securely in its current position. The control system is now inoperable.

3.2.5 Operational limit stop for lifting and lowering limiter

⚠ WARNING

Danger of chain breakage due to damage to the lowering limiter
The lowering limiter must not be started under normal operating conditions. Before using the hoist, make sure that the length of the chain is sufficient so that the lifted load can be placed on the ground at its final destination.

- Make sure that the installed chain length exceeds the chain length required for the application.

⚠ WARNING

Risk of chain breakage due to damage to the lifting limiter buffer
The operational limit stop for lifting may be started under normal operating conditions. However, a damaged buffer and/or a damaged shut-off valve can exert unacceptably high forces on the chain if the hook is moved to the end position.

- Use the hoist only with functioning buffer and end stop
- Check buffer and end stop regularly (→ section 6.1.4, page 21)

The hoist is equipped with limiters which switch off the lifting or lowering movement.
To achieve this, valves are integrated in the hoist. These are switched by the buffer discs. The control circuit is interrupted in the appropriate direction. The load is held securely in its current position. The opposite direction remains functional.

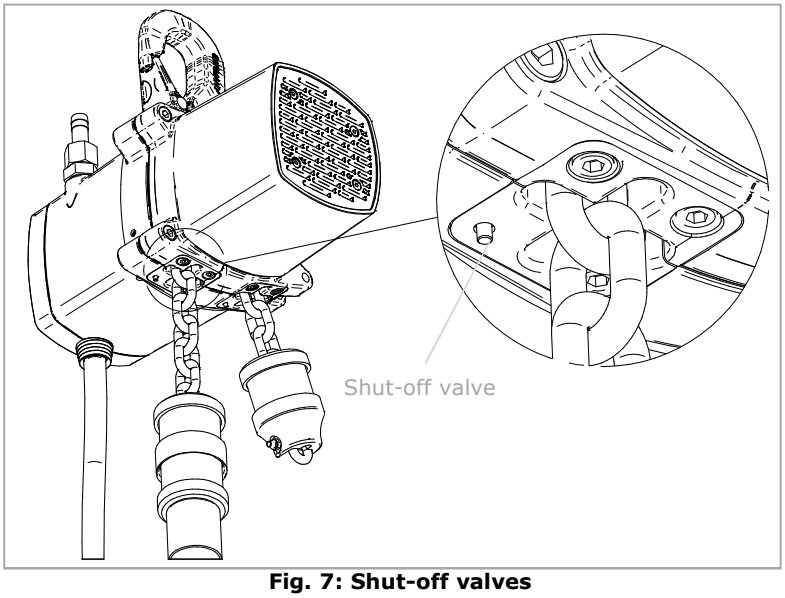


Fig. 7: Shut-off valves

3.3 Load capacity

The permissible load capacity of the hoist is shown in the following table:

Type	mini 125	mini 250	mini 500	mini 1000
Load capacity	125 kg (275 lbs)	250 kg (550 lbs)	500 kg (1100 lbs)	980 kg (2200 lbs)

3.4 Service life – Group of mechanism according to FEM / ISO

Hoists from the mini series are classified in group of mechanism M4 / 1Am according to ISO 4301 / FEM 9.511. The theoretical service life is therefore 800 full load hours or a maximum of 10 years if the approved theoretical full load hours have not been reached before.
Measures must be taken during the service life to reach the safe operating period (→ section 7.1, page 26).
Special tests within the scope of a general overhaul are required after the theoretical service lift has expired. The general overhaul must be initiated by the operating company and must be documented in the inspection log. The general overhaul is used to assess the condition of the components and to determine all defective or near-defective components. As a result, the replacement of individual components or entire assemblies may be necessary. The scope of general overhauls shall be determined taking into account the specifications of JDN. Please contact us, if required.

3.5 Information on explosion protection

Hoists from the mini series are marked as follows in accordance with EU Directive 2014/34/EU and DIN EN 13463-1:

⟨Ex⟩ II 3 GD IIA T4(X)

The additional marking "X" refers to the explosion protection in the operating instructions.

Your product mini 500 is a device in category 3, can be used in general industry, in zone 2 for gases of the explosion group IIA with an ignition temperature over 135°C (275°F).
Your product can also be used in zone 22 for dusts with smouldering temperatures above 210°C (410°F) or ignition temperatures above 203°C (398°F). Use for light metal or other impact-sensitive dusts is not permitted. The thickness of the dust layer must not exceed 5 mm.
The permissible ambient temperature range is from -20°C (-4°F) to +50°C (+122°F).

Load chain:
To ensure the required earthing, badly rusted chains may no longer be used. For, depending on the degree of corrosion, the conductivity of the chain may deteriorate so that it is no longer sufficient. The chain and load are always to be moved in such a way that sliding and/or frictional contact with other systems and components is excluded. If circumstances do not permit this, it necessary to ensure an absence of explosive atmospheres during operation.

Earthing:
The hoist is earthed via the suspension (support hook). The hand control is conductively connected to the hoist body via the strain relief and the final cable lug.

Assembly, maintenance and disassembly work:

⚠ WARNING

Risk of explosion
- Observe the national regulations and work instructions at your workplace when carrying out assembly, maintenance and disassembly work in explosion-hazardous areas.

Cleaning plastic surfaces:

⚠ WARNING

Risk of explosion
Electrostatic charging may occur at the plastic surfaces due to mechanical friction, potentially leading to brushing discharges that can ignite gases and air mixtures.
- Only clean the surfaces with a damp cloth (cleaning cloth with water) to reduce the electrostatic charging.

3.6 Compressed air requirement

3.6.1 Connection

To connect the hoist to the on-site compressed air supply, a hose nozzle with union nut is screwed loosely onto the sealed double nipple. The hose nozzle with union nut is suitable for compressed air hoses with an inside diameter of d_i=13mm ($^1/_2$"). The double nipple has the connection size G1/2".

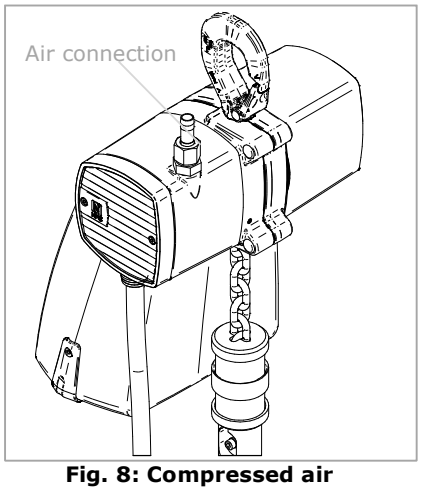


Fig. 8: Compressed air connection

3.6.2 Pressure

⚠ WARNING

Risk of explosion
Operating at higher pressures may result in hazards due to overload. When operating at lower pressures, the brake can grind and is therefore subject to very high wear. Inadmissibly high heating may result. The load carrying capacity of the device is reduced. The response of the control system decreases noticeably.
- Comply with the specified pressure.
- Note the possible pressure loss with long hose lines.

Your hoist must be operated with a nominal pressure of 6 bar (85psi) (see specification on the nameplate). The pressure existing in the line must correspond to the nominal pressure.
- Use the corresponding hose lines for the pressure.
- Higher pressures must be reduced to nominal pressure.

After switching on, the adjoining nominal pressure p_1 reduces to the flow pressure p_2. The extent of the flow pressure p_2 at which the hoist is operated depends upon the weight of the load and the direction of movement of the load.
When lifting the nominal load the flow pressure p_2 may at a maximum be 10% below the specified nominal pressure of the hoist (measured immediately before the lifting motor)!

3.6.3 Volume

The air consumption of the hoist is shown in the following table:

Type		mini 125	mini 250	mini 500	mini 1000
Air consumption when lifting with nominal load	m³/min (cfm)	0,95 (33.5)	0,95 (33.5)	1,7 (60.0)	1,7 (60.0)
Air consumption when lowering with nominal load	m³/min (cfm)	0,95 (33.5)	0,95 (33.5)	1,7 (60.0)	1,7 (60.0)

3.6.4 Quality of the compressed air

NOTICE

There is a danger of icing in the motor if there is moist air and ambient temperatures at or below 0°C (32°F)! You can avoid icing by:
- the use of an upstream air dryer
- when using a service unit with an oiler, depending on the moisture content of the compressed air, add an anti-icing agent to the lubricating oil or use an air lubricator with an anti-icing addictive for the corresponding temperatures.

Your hoist must be operated with a sufficiently clean and dry working air. The air supply must fulfil the following quality requirements:
- Particle size less than 40 µm (1.57 mils)
- Particle density lower than 10mg/m³
- Pressure dew point at least 10K below the lowest expected ambient temperature

To provide a sufficient compressed air quality, we recommend operation with a filter regulator.
Do not operate your product with other gases!

3.7 Sound pressure level

The sound pressure level was determined on the basis of EN ISO 11201. Since the operator location is flexible due to different control lengths, the measurement was carried out according to standard at a distance of 1m from the hoist.

Type			mini 125	mini 250	mini 500	mini 1000
A-weighted emission sound pressure level L_{p1}	Lifting with nominal load	dB	78	78	78	78
	Lowering with nominal load	dB	80	80	80	80

The above values were determined on a test bench. On-site occurrences such as reflections from surrounding structures can influence the values.

The following formula can be used to determine the emission sound pressure level L_{pr} at the operator site for buildings of common structural design:

$$L_{pr} = L_{p1} - 10 \cdot \lg(\mathrm{d})$$ with d=distance from operator site to hoist body

3.8 Operating conditions

⚠ CAUTION

Safe and proper operation of the hoist is only possible if the specified operating conditions are observed.

- Adhere to the specified operating conditions.
- If other operating conditions are present, please contact JDN.

Your hoist is very sturdy and low-maintenance. It is suitable for use in explosion-hazardous areas, as well as in areas with increased concentrations of soot, dust and humidity.

Permissible ambient temperature	Permissible air humidity	Explosion hazardous areas
-20°C (-4°F) to +50°C (+122°F) if the hoist is not heated above this level due to external influences	0% to 100%	Zone 2 (→ section 3.5, page 11)

For stationary use outdoors, you must protect your hoist against the effects of weather and shorten the maintenance intervals.
Stopping and securing against the wind is required upon reaching a critical wind surge pressure. The critical wind surge pressure depends on the mass and shape of the load to be lifted and must be determined by the operating company.

Your hoist may not be used in the following areas, among others (for further areas → section 2.4, page 5):

- critical areas in nuclear plants
- over acid baths or systems with aggressive substances
- in areas where there are organic acids
- in areas outside of the permissible ambient temperatures

3.9 NFC chip / QR code

The NFC chip located in the motor cover below the NFC symbol or the QR code on the nameplate provides you with access to all relevant technical data and documents of your hoist as well as their updates.

4 TRANSPORT AND STORAGE

4.1 Transporting

NOTICE
Note the weight of the hoist of 10kg (22lbs) for the mini 125/250 or 20,5/21kg (45/46lbs) for the mini 500/1000. This weight applies for a lift of 3m (10ft), each metre (ft) of additional lifting height increases the weight by 0.5kg (0.35lbs) for the mini 125/250 or 1.2kg (0.81lbs) for the mini 500/1000.

4.1.1 Change of operating site

⚠ WARNING
Danger from the load falling A chain that becomes knotted in the chain box during transport can cause a chain breakage during subsequent operation if the chain knot blocks the entry of the chain into the hoist. ➢ After each change of operating site, empty the chain box by hand and run the chain via the chain drive back into the chain box (→ section 5.5, page 17).

If you want to transport your hoist to another site, please observe the following points:

1) Reel the chain so that so that no loops can form and the chain cannot become twisted.
2) Depressurise the power supply and disconnect the air connection from the device.
3) Close the air connection in order to prevent dirt ingress.
4) Remove hoist from suspension and carefully set the hoist down and do not allow it to fall.
5) Lay the control hose so that it cannot be kinked.
6) When operating the hoist at a new site, observe the chapter "Commissioning".

4.2 Storage conditions

4.2.1 Breaks in operation

1) Bring the load hook into the upper end position. Ensure that the lifting limiter is not triggered and the buffer does not come into contact with the housing.
2) Depressurise the power supply.
3) In the case of longer operational breaks, coat the chain and hook with a light film of oil.

4.2.2 Storage

NOTE
The original packaging is not intended for storing the hoist for a period longer than 12 months.

1) Motor conservation: Lubricate the motor shortly before storing the device (→ section 7.3.3, page 29).
2) Coat all bare components with a light oil film.
3) Reel the chain so that so that no loops can form and the chain cannot become twisted.
4) Depressurise the power supply and disconnect the air connection from the device, close the air connection in order to prevent dirt ingress.
5) Remove hoist from suspension and carefully set the hoist down and do not allow it to fall.
6) Lay the control hose so that it cannot be kinked.
7) Store the hoist in a dry and clean location.

5 INITIAL OPERATION

⚠ WARNING

Risk of explosion
Observe the national regulations and work instructions at your workplace when carrying out assembly, maintenance and disassembly work in explosion-hazardous areas.

5.1 Unpacking

NOTICE

Note the weight of the hoist of 10kg (22lbs) for the mini 125/250 or 20,5/21kg (45/46lbs) for the mini 500/1000. This weight applies for a lift of 3m (10ft), each metre (ft) of additional lifting height increases the weight by 0.5kg (0.35lbs) for the mini 125/250 or 1.2kg (0.81lbs) for the mini 500/1000.

The hoist is packaged in environmentally friendly cardboard packaging. Immediately after opening the packaging, check the delivery for completeness and damage. To unpack, proceed as follows:

1) Keep the accompanying documents in the place provided near the site of application.
2) Lift the hoist carefully out of the packaging.
3) Dispose of packaging in the local recycling system.

5.2 Shortening the control length if necessary

⚠ WARNING

Risk of explosion
By removing the cable lug, the conductive connection between the hand control and the hoist is removed and the hand control can become electrostatically charged.

- If possible, do not remove the cable lug when shortening the control length. In case of removal, reattach a new cable lug to the end of the shortened wire rope.
- At the end of the installation, it is essential that you reconnect the cable lug of the wire rope to the motor housing.

⚠ CAUTION

Danger due to escaping compressed air
When releasing the supply hose of the hand control, compressed air flows out if the hoist is under pressure.

- Block the compressed air supply and depressurise the device.

NOTICE

Do not damage the individual compressed air hoses when shortening. This can result in functional losses.

1) Depressurise the hoist and open the motor cover.
2) Detach the control hoses, the cable lug and unscrew the motor cover.
3) Push the hose casing upwards out of the motor cover, pull the cone out of the hose, remove the wire rope barrel from the motor cover and pull the complete control hose out of the motor cover.
4) Shorten the sheathing to the desired length. Take care not to damage the compressed air hoses. Shorten the compressed air hoses and the wire rope according to the illustration.
5) Push the hose back through the motor cover and insert the cone flush. Pull the hose briefly so that it becomes wedged in the motor cover.Insert the wire rope barrel into the motor cover and secure the wire rope over the screw in the wire rope barrel.
6) Screw the motor cover back onto the motor housing, reconnect the cable lug to the motor housing and connect the hoses. Observe the designations on the motor cover.
7) Attach the motor housing cover.

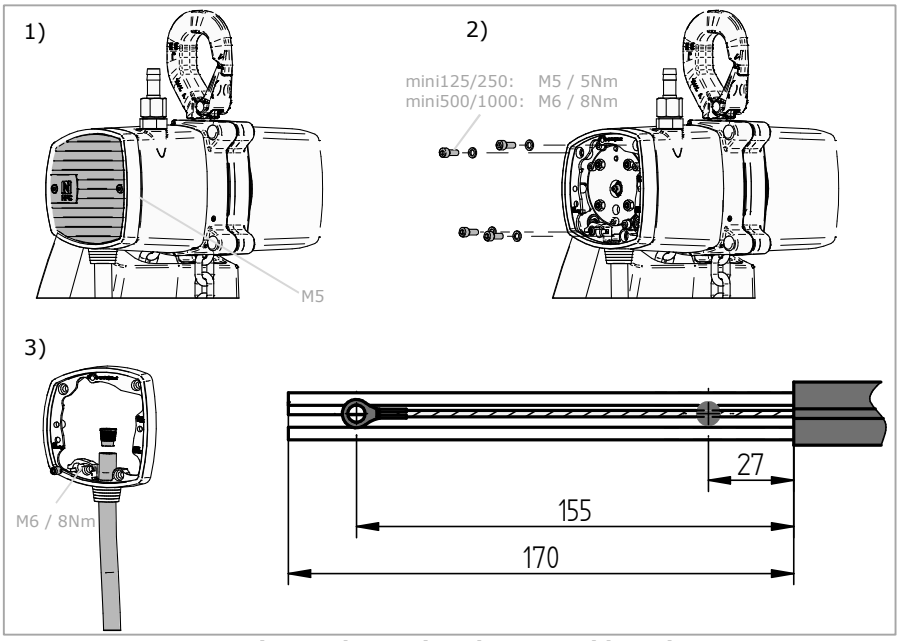


Fig. 9: Shortening the control length

5.3 Suspending the hoist

⚠ WARNING

Danger due to inadequate qualifications

A faulty installation may result in serious accidents.

- The hoist may only be installed by qualified personnel in compliance with all applicable national safety regulations (→ chapter 2).

⚠ WARNING

Danger from the load falling

Vibrations damage the chain and can lead to chain breakage.

- The supporting structure must form a rigid support.
- Furthermore, no external vibrations may be transferred to your hoist (e.g. from the attached load).

⚠ WARNING

Danger from the load falling

Due to the dynamic behaviour of the hoist, impact forces can occur which can be several times the load weight. The supporting structure must be sufficiently dimensioned for this. The hoist has no overload protection.

- The attachment point and the supporting structure for your hoist must be able to safely absorb the forces to be expected according to the following table (DIN EN 14492-2:2010).
- Ensure that your product can be freely aligned under load, as otherwise impermissible additional loads may occur.

Type		mini 125	mini 250	mini 500	mini 1000
Impact factor	-	4,6	2,2	2,0	1,6
Load capacity	kg (lbs)	125 (275)	250 (550)	500 (1100)	980 (2200)
Maximum dynamic force on supporting structure at rated load (without oblique pulling)	kN (lbf)	5,65 (1270)	5,40 (1215)	9,81 (2205)	15,40 (3460)

5.3.1 Hoist with support hook with hook safety catch

1) Hang the hoist in the on-site suspension.
2) Make sure that
   a) the on-site suspension is on the central axis of the support hook.
   b) the hook safety catch is closed.
   c) the support hook can swing slightly in all directions.

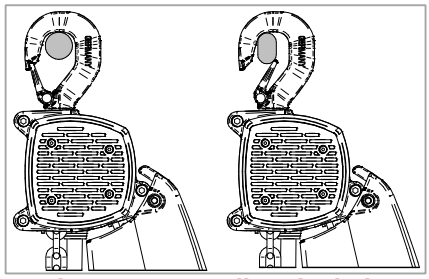


Fig. 10: Suspending the hoist

5.3.2 Hoist with support hook with twist-lock safety device

1) Hang the hoist in the on-site suspension.
2) Make sure that
   a) the on-site suspension is on the central axis of the support hook.
   a) the twist-lock is closed.
   b) the support hook can swing slightly in all directions.

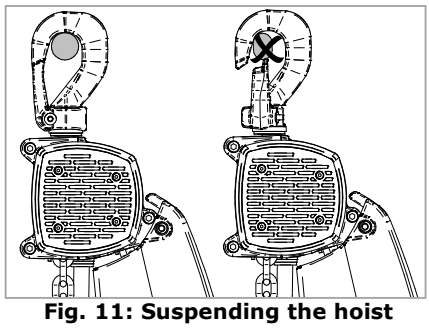


Fig. 11: Suspending the hoist

5.4 Connecting the air supply

Technical connection data / requirements → section 3.6, page 11

1) Check air connection parts for dirt and clean them if necessary.
2) Sparge the compressed air hose to remove foreign bodies.
3) Connect the compressed air hose to the port and screw on the union nut.
4) Make sure that the connection is secure and tight.

5.5 Emptying the chain container and running the chain into the chain container

⚠ WARNING

Danger from the load falling

A chain that becomes knotted in the chain box during transport can cause a chain breakage during subsequent operation if the chain knot blocks the entry of the chain into the hoist.

- Empty the chain box by hand and run the chain back into the chain box via the chain drive.

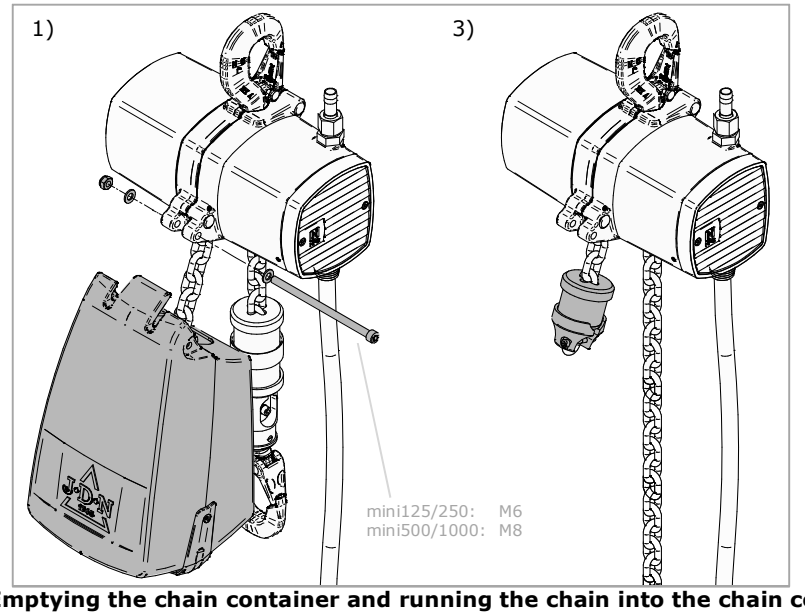


Fig. 12: Emptying the chain container and running the chain into the chain container

1) Loosen the chain container and remove the chain container a little away from the hoist.
2) Empty the chain from the chain container by hand. Make sure that nobody is under the hoist and that nobody is hit by the chain.
3) Then lower the hook until just before the buffer of the idle chain touches the hoist body.
4) Secure the chain container and run the chain into the chain container by lifting.

5.6 Lubricating the chain

⚠ WARNING

Danger from chain fracture
An insufficiently lubricated chain can lead to increased wear during continued operation and ultimately to chain breakage.
- The chain must always be coated with a light lubricating film.
- The contact points of the chain must be carefully lubricated.

The chain is delivered from the factory in slightly oiled condition. It is recommended to lubricate the chain directly before commissioning. To lubricate the chain see section 7.3.2, page 28. It must be ensured that the chain is always sufficiently lubricated during operation (check → section 6.1.1, page 20).

5.7 Setting the maximum speed

The maximum speed of the hoist can be adjusted via a throttle (→ section 3.2.1, page 8). Unless ordered otherwise, the maximum speed is set to the maximum possible value in the factory. The setting range is between the following values:

Hoist	Adjusting the throttle	Max. lifting speed at nominal load	Max. lowering speed at nominal load
mini 125 / 250	minimal	100%	100%
	maximal	~55%	~70%
mini 500 / 1000	minimal	100%	100%
	maximal	~50%	~65%

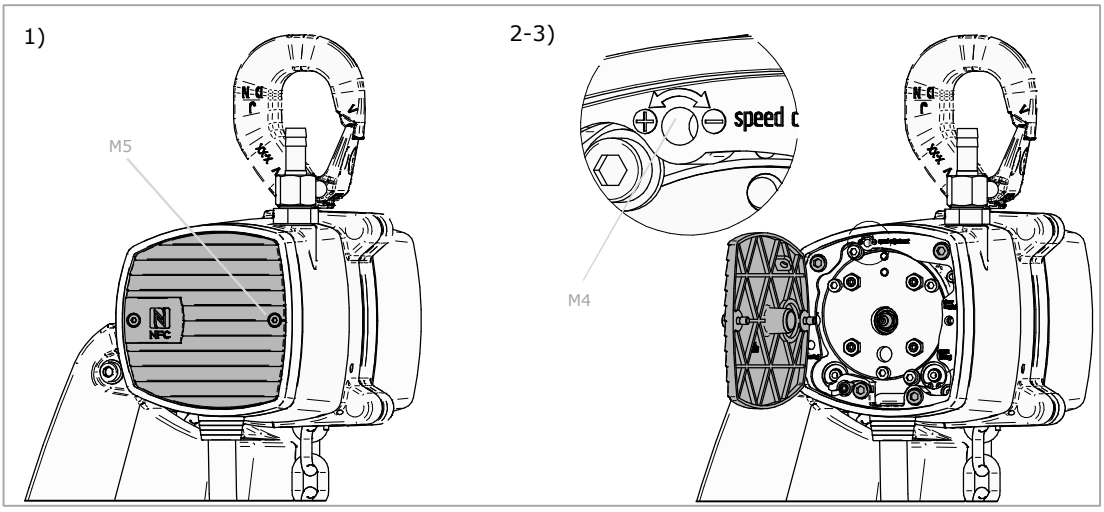


Fig. 13: Setting the max. speed

1) Remove the motor housing cover.
2) The motor housing cover is connected to the motor cover so that it cannot be lost. The adjusting screw of the throttle is located centrally at the top of the motor.
3) The maximum speed can be changed by turning the adjusting screw. Clockwise – max. speed is reduced, counterclockwise – max. speed is increased. The adjusting screw has an adjustment range of approx. 14 revolutions. The end positions are secured by a stop. Turn carefully, the screw must be easy to turn by hand.
4) Refit the motor cover.

5.8 Tests before commissioning

⚠ WARNING

Danger to life
If the hoist is put into operation without proper testing (e.g. in accordance with the currently applicable accident prevention regulations), there is a danger to life and health.

- The hoist, including the supporting structure, must be inspected by an appropriately trained and qualified person before initial operation and before re-commissioning after significant modifications.
- National regulations must be observed.

The testing extends from the installation, outfitting and operational ability under normal conditions, mainly to check the completeness, suitability and effectiveness of the safety equipment, as well as to the state of the device, the lifting gear, the equipment and the load-bearing medium. The testing must be entered in the accompanying inspection log.

In addition to national regulations, the following points must be checked before commissioning:

- Hoist suspension
- Presence of the operating instructions at the workplace
- Proper functioning of the emergency stop function (check → section 6.1.3, page 20)
- Proper functioning of the lifting and lowering switch-off (check → section 6.1.4 and 7.8, page 21 and 33)
- Air supply (→ section 3.6, page 11)
- Lubrication of the chain according to the intended application (lubricating the chain → section 5.6, page 18)

6 OPERATION

As an operator, you are responsible for your own safety and the safety of your colleagues in the working area of the hoist.

- The hoist may only be operated by persons authorised by the operating company.
- Before using the hoist for the first time, familiarise yourself with all permissible operating conditions. For this purpose, read these operation instructions thoroughly and carry out the described actions on the hoist, step by step.
- Report any malfunction to your safety officer immediately so that the fault can be rectified at once.
- Follow the regulations of the accident protection organisation, in Germany for example the accident prevention regulations of the professional associations.
- Observe the points *Proper use*, *Improper use* and *Operating conditions* in these operating instructions (→ section 2.3, 2.4 and 3.8).

For particularly difficult cases of application with your hoist, the contractor must create operating instructions in an intelligible form in the operator's language while taking this user manual into consideration.
These instructions shall regulate measures for safe operation according to the operational conditions.

6.1 Checks before each start of work

The checks cover the completeness, suitability and effectiveness of the safety devices as well as the condition of the device.

6.1.1 Checking the condition of the chain

⚠ WARNING

Danger from chain fracture
A damaged, blocked or insufficiently lubricated chain can lead to a chain breakage during continued operation.

- Do not work with a chain that is drawn tight, bent or extended. Do not work with a damaged, worn or rusty chain.
- The chain must be coated with a light lubricating film. If this is not the case, lubricate the chain (→ section 7.3.3, page 28).

The chain must be visually inspected for damage and sufficient lubrication prior to beginning work.

6.1.2 Checking the control device

⚠ WARNING

Danger from faulty controller
A rough-running control element or a control element that is stuck in an actuated position may indicate a faulty controller.

- Do not use the hoist
- Have the hoist repaired

To test the control device, briefly actuate all control elements of the controller one after the other and release them. The control elements must return to their initial positions immediately. The on and off function must operate without problem. All control elements of the controls must always be free-moving. The direction of movement of the hook must correspond to the direction indicated by the arrows on the control elements.

6.1.3 Checking the emergency stop

⚠ WARNING

Danger from faulty emergency stop
A non-functioning emergency stop impairs the safety of your product.

- Use the hoist only with a functioning emergency stop
- Have the hoist repaired in the event of damage

To test the emergency stop function, move the hoist using the controller. Press the emergency stop button during movement (→ section 6.5, page 24): All movement of your product must stop. Actuating

the control elements must not cause any movement. The load must be held securely in its present position. Then release the emergency stop button.

6.1.4 Checking the operational limit stop for lifting and the buffers

⚠ WARNING

Danger from chain fracture
A damaged buffer or non-functioning end stop can lead to a fracture of the chain if the upper hook end position is met.
- Use the hoist only with functioning buffer and end stop
- Have the hoist repaired in the event of damage

The buffers of the lifting limiter must be visually inspected. If the buffers have cracks, permanent deformations or other damage, they must be replaced.

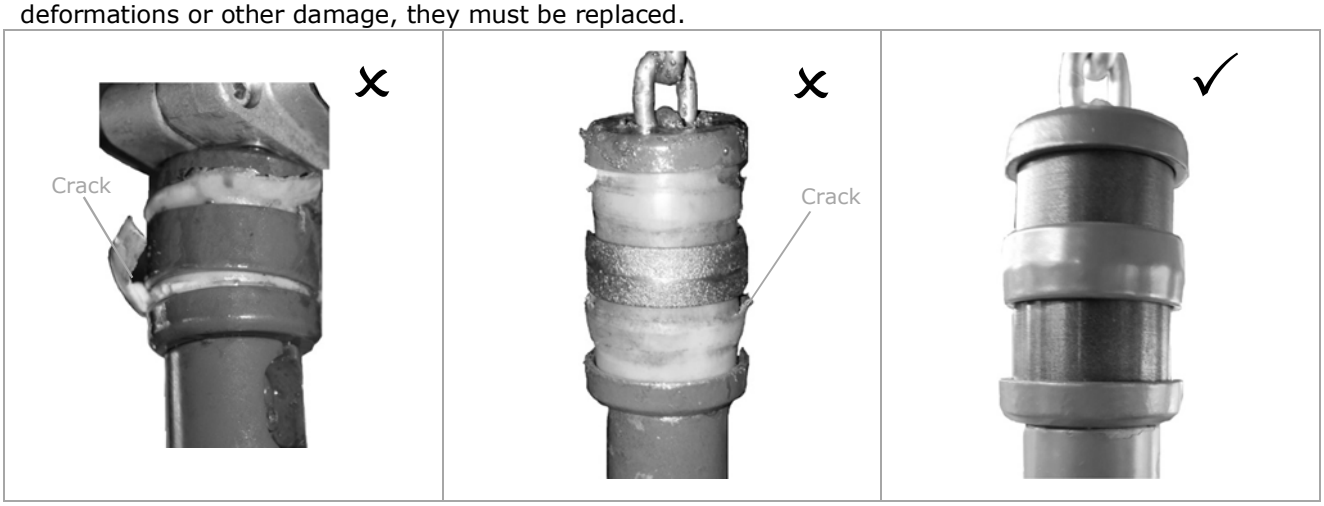


Fig. 14: Checking the buffer of the end stop

To check the end stop of the upper hook position, move the unloaded hook to just before the upper end position. Stop immediately before reaching the end position and then carefully move to the end position. The movement of the chain must be automatically interrupted by stopping the motor when the shut-off valve is actuated. Deformation of the buffer must be kept to a minimum. A defective shut-off valve is characterised by the fact that the buffer is heavily deformed and hardly visible between the buffer discs (Abb. 14, left image). Once the relevant load movement has been stopped, it is only possible to move it in the opposite direction until the relevant end position has been left.

6.2 Attaching the load

⚠ WARNING

Danger from the load falling
Incorrect attachment or overload can cause the load to crash.
- Never use the load chain to attach the load.
- Only use suitable and approved slinging aids.
- Follow the relevant instructions for attaching loads.
- Always only attach one load, never several loads simultaneously.
- Before lifting loads, ensure that the maximum permissible load is not exceeded! Slinging aids must be added to the load.
- Before slinging, align the load exactly vertically under the product. Chain must hang vertically before lifting (→ section 2.5, page 5).
- Do not clamp the hook at the attachment point.
- Ensure that there is no threat to the operator at the workplace due to slings or the load.
- Never allow loads to fall onto the chain.
- If a load with several products is lifted, avoid overloading due to an incorrect load distribution.
- Uncontrolled external force impacts (such as from hydraulic cylinder, falling loads) are not allowed.

In Germany, the professional association rule "Operation of load lifting equipment in hoist operation" is to be followed (→ DGUV Rule 100-500 section 2.8). In other countries, corresponding national regulations are to be observed.

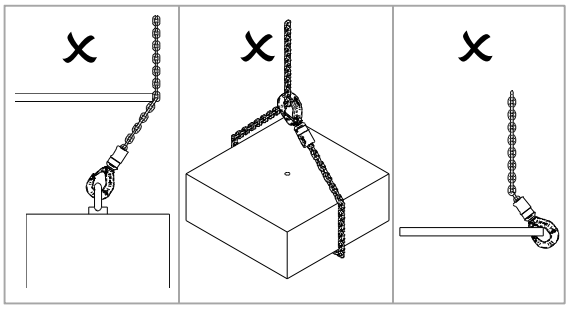


Fig. 15: Examples of incorrect attachment of the load

6.2.1 Load attachment for load hooks with hook safety catch

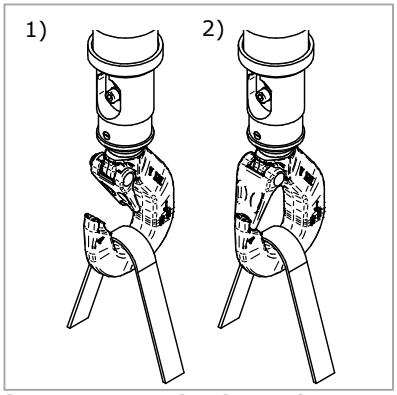


Fig. 16: Secure load attachment

- Press on the hook safety catch and connect the sling gear at the lowest point of the hook. Never load the tip of the hook!
- Ensure that the hook safety catch is closed by the spring return.

6.2.2 Load attachment for load hooks with twist-lock safety device

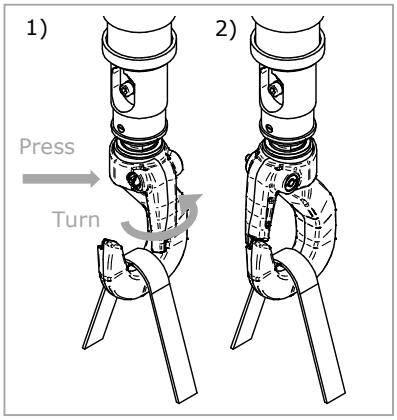


Fig. 17: Secure load attachment

- Unlock the twist-lock safety device by pressing and turning it and hold it in position. Connect the sling gear at the lowest point of the hook. Never load the tip of the hook!
- Ensure that the locking mechanism is reset by the spring and engages.

6.3 Moving the load

⚠ WARNING

Danger from the load falling

Incorrect attachment or overload can cause the load to crash.

- Do not lift the load at maximum speed if the chain is hanging slack.
- When lifting and setting down, ensure a stable position of the load to avoid accidents from the load tipping or falling down.
- Never drive against a stuck load.
- When lifting the load in non-visible areas, special safety precautions must be taken.
- Never allow persons to stand under a suspended load.
- Never try to correct a fault with a suspended load.
- Select a safe operating location.

⚠ WARNING

Danger of chain breakage due to knot formation in the chain
When a load is taken up suddenly on slack chain, the chain may knot in the chain box. In rare cases, this may result in the load hook no longer being able to be lowered across the full hook path. A knot has formed in the idle chain strand which was driven against the lowering chain inlet during lowering and blocked the chain.

- Do not move from the slack chain.
- Observe the maintenance interval of the chain.

⚠ WARNING

Crushing hazards
Reaching into the chain or the unintentional pulling of clothes into the chain can cause crushing. Especially with oblique pulling, the load may swing when lifted.

- Never touch a running chain or the chain inlets.
- Wear tight-fitting work clothing.
- Lift the load slowly to prevent swinging.

⚠ CAUTION

Dangers from faulty controller
A malfunctioning or manipulated controller can result in hazards.

- Never lock the control elements of the control devices.
- Do not kink or squeeze the control hoses.
- In the event of a power failure, secure the load and the area around the load until the power supply is restored.

6.3.1 Lifting the load

1) First pull the slacking chain taut. Briefly interrupt the lifting process when tightening the chain. The hoist can be aligned and the material is protected.
2) Then lift the load.

6.3.2 Lowering the load

⚠ WARNING

Dangers from being struck
People can be struck and killed from lowering loads.

- Make sure that no one is below the load or in the hazard area of the load.

⚠ WARNING

Danger of chain breakage due to damage to the lowering limiter
The lowering limiter must not be started under normal operating conditions. Ensure that the length of the chain is sufficient so that the lifted load can be set down on the floor at its destination.

- Make sure that the installed chain length exceeds the chain length required for the application.

1) Lower the load using the hand control and set it down carefully.

6.4 Releasing / detaching the load

1) Lower the load hook so far that the load no longer is exerting any force on the load-bearing medium (e.g. by securely setting it down), detach the load
2) Move the load hook out of the lifting area, in order to avoid hazardous situations.

6.5 Operating the emergency stop

⚠ WARNING

Danger from maintaining hazardous situations
Danger persists by maintaining a dangerous situation.
- Never release the emergency stop button before the danger is eliminated and, if necessary, the stop function is restored via the push buttons or press buttons.

In order to avert a danger caused by the movement, the push buttons are to be let go as quickly as possible. The load movement will be stopped immediately.
Only press the red emergency stop button firmly if this stop function fails. The emergency stop button engages. Your hoist will come to a stop instantly. The push buttons are now inoperable.
The emergency stop button can be released again by turning it counterclockwise. It springs back. The push buttons are now operable again.

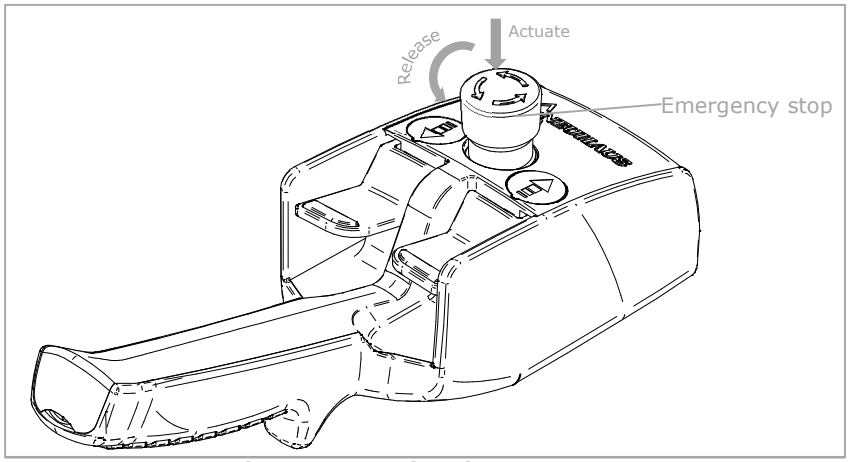


Fig. 18: Operating the emergency stop

6.6 Interrupting work

If you want to interrupt work with your hoist:
1) Set down and release/detach the load.
2) Move the load hook out of the lifting area, in order to avoid hazardous situations.

7 MAINTENANCE AND REPAIR

⚠ CAUTION

Risk of explosion

- Observe the national regulations and work instructions at your workplace when carrying out assembly, maintenance and disassembly work in explosion-hazardous areas.

⚠ CAUTION

Dangers due to improper repair

Improper repair can lead to errors on the product and thus to hazardous situations.

- Maintenance work on your product may only be performed by trained and qualified personnel!
- Provide appropriate access to the product.
- Disconnect the hoist from the air supply and depressurise by pressing a push button.
- Never try to correct a fault with a suspended load.

Your product is very sturdy and low-maintenance. Compliance with maintenance and inspection intervals is of great importance in order that your product operates safely and reliably over a period of many years.

Hoists from the mini series are classified in driving mechanism classification M4 / 1Am according to ISO 4301 / FEM 9.511. The theoretical service life (safe operating period) is therefore 800 full load hours or a maximum of 10 years if the permitted theoretical full load hours have not yet been reached.
In order to achieve safe operating periods, the company must check that the theoretical operating time has been achieved during each inspection, by the person responsible. This must be documented in the inspection log at least once annually. If intensive use of the hoist is planned (e.g. in shift operation), documentation must be carried out more frequently.

7.1 Maintenance and inspection intervals

The following maintenance and inspection intervals must be observed. The intervals are determined by two criteria, full load hours and period. The criterion which is reached first is decisive for the maintenance or inspection measures.

Maintenance and inspection measures	Interval	Section
Determine actual service life	Min. once a year	7.2, page 26
Oils and greases		
Lubricate chain	Every 24 full load hours or every 3 months	7.3.2, page 28
Lubricate motor	Every 80 operationg hours or every 3 months	7.3.3, page 29
Functional checks		
Check brakes with nominal load	Every 400 full load hours or every year	7.4, page 29
Checking for wear		
Check chain	Every 24 full load hours or every 3 months	7.5, page 30
Check chain inlet	Every 80 full load hours or or every year	7.6, page 32
Check hook	Every 80 full load hours or or every year	7.7, page 33
Check chain box and lowering limiter	Every 80 full load hours or or every year	7.8, page 33
Check chain guide, chain sprocket and pinion shaft	Every 400 full load hours or every 5 years	7.9, page 35
Check vanes and brake lining	Every 200 full load hours or every 2 years	7.10, page 36
Check silencer	Every 200 full load hours or every 2 years	7.11, page 37
Check gearbox lubrication	Every 400 full load hours or every 5 years	7.12, page 38

7.2 Determining the actual use in full load hours

The actual service life in full load hours T_B must be calculated and documented at regular intervals. It is recommended to estimate the future service life of the hoist before putting it into operation in order to comply with the specified maintenance intervals.
The actual service life in full load hours can be determined as follows:

$$T_B = 1{,}2 \cdot k_m \cdot t_b$$

k_m Load spectrum factor
t_b Operating hours in h

The load spectrum factor k_m takes into account the utilisation of the load capacity of the hoist. A hoist operated at partial load uses considerably less of the service life of the hoist than a hoist operated at full load. The load spectrum factor is calculated using individual partial load spectrum factors $k_{m,i}$ that depend on the mode of operation of the hoist. The following formula applies

$$k_{m,i} = \beta_i^3 \cdot t_i$$

$$\beta_i = \frac{Load\ m_{L,i}}{Load\ capacity\ m_{RC}}$$

$$t_i = \frac{Operating\ time\ with\ specific\ load\ t_{L,i}}{Operating\ time\ t_b}$$

Running times without load are not taken into account. However, if the weight of the load sling is more than 5% of the hoist load capacity, this weight must be taken into account in the ultimate load.
The operating time t_b results from the addition of the running times of the individual loads $t_{L,i}$.

The running time with the respective ultimate load can alternatively be determined by the number of work cycles:

$$t_L = \left(\frac{Hook\ travel}{Lifting\ speed} + \frac{Hook}{Lowering\ speed}\right) \cdot work\ cycles$$

The factors $k_{m,i}$ and t_i must be determined for individual payloads and added to the k_m and t_b totals. For determining the actual use, it is permissible to use the nominal speeds at nominal load throughout for the speeds. For devices used mainly in vertical operation (from 75% of on-time), the factor $k_{m,i}$ must also be multiplied by the factor $f_v = 1 + 0{,}5 \cdot \frac{P-50}{50}$ (for P>50%). The factor f_v has a value of 1 to 50% of the nominal load, increasing linearly to 1.5 at 100% of the nominal load (nominal load percentage P). The following example shows the simple application of the above formulas in a table.

7.2.1 Example

Technical data of the hoist:

Hoist	Load capacity	Lifting speed	Lowering speed
mini 500	500kg	12 m/min	20 m/min

Mode of operation (e.g. last 220 working days, uniform lifting and lowering operation):

Load	Work cycles per day	Work path	β_i	t_i	$k_{m,i}$
500kg	10	3m	$\frac{500kg}{500kg} = 1{,}0$	$\left(\frac{3m}{12m/min} + \frac{3m}{20m/min}\right) \cdot 10 \cdot 220 = 880min = 14{,}7h$	$1^3 \cdot \frac{14{,}7h}{93{,}6h} = 0{,}157$
300kg	15	3m	$\frac{300kg}{500kg} = 0{,}6$	$\left(\frac{3m}{12m/min} + \frac{3m}{20m/min}\right) \cdot 15 \cdot 220 = 1320min = 22{,}0h$	$0{,}6^3 \cdot \frac{22{,}0h}{93{,}6h} = 0{,}051$
150kg	23	3m	$\frac{150kg}{500kg} = 0{,}3$	$\left(\frac{3m}{12m/min} + \frac{3m}{20m/min}\right) \cdot 23 \cdot 220 = 352min = 33{,}7h$	$0{,}3^3 \cdot \frac{33{,}7h}{93{,}6h} = 0{,}010$
0kg	10	1m	-	$\left(\frac{1m}{12m/min} + \frac{1m}{20m/min}\right) \cdot 10 \cdot 220 = 1393min = 23{,}2h$	-
			Σ	$\boldsymbol{t_B = 93{,}6h}$	$\boldsymbol{k_m = 0{,}218}$

Actual service life and remaining service life:

Date	Operating hours t_b	Load spectrum Factor k_m	Service life in full load hours T_B	Remaining service life in full load hours	Date / Specialist inspector
10/01/	-	-	-	$800h$ (Initial operation)	*10/01/ / Signature*
10/01/ - 15/12/	93.6h	0.218	$1{,}2 \cdot 93{,}6h \cdot 0{,}218 = 24{,}5h$	$800h - 24{,}5h = 775{,}5h$	*15/12/ / Signature*
…	…	…	…	$775{,}5h - \cdots h = \cdots h$	…
…	…	…	…	…	…

7.2.2 Example load spectrums according to FEM 9.511

To determine the mode of operation for calculating the partial operating times (actual operating time), the following load spectrum diagrams can also be used (x-axis: relative operating time, y-axis: relative load).

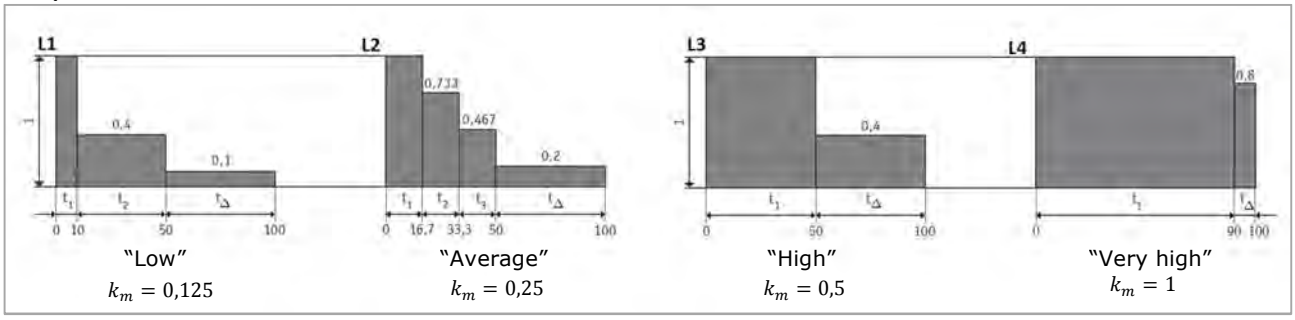


Fig. 19: Load spectrums according to FEM 9.511

7.3 Oils and greases

Motor and chain must be lubricated during operation.

7.3.1 Lubricants

⚠ CAUTION

Danger of skin irritation
Oils and greases may cause skin irritation.
- Wear protective gloves.
- Observe the safety data sheet of the lubricant used.

NOTE

Do not mix synthetic oils or greases with mineral oils or greases, as the properties may deteriorate. Also never mix different types of lubricating grease within the synthetic or mineral lubricant groups. The following lubricant recommendations are given for various areas of application.

Application area	Chain	Motor	Gearbox
Industrial sector	Rivolta S.K.D. 2000	JDN high-performance grease Item. no. 00016002	Castrol Spheerol EPL 2
Food industry	Bremer & Leguil Cassida Chain Oil LT Spray	Castrol Optileb GR FS 2	Castrol Optileb GR FS 2

7.3.2 Lubricating the chain

⚠ WARNING

Danger from chain fracture
An insufficiently lubricated chain can lead to increased wear during continued operation and ultimately to chain breakage.
- The chain must always be coated with a light lubricating film.
- The contact points of the chain must be carefully lubricated.

⚠ CAUTION

Crushing hazards
Reaching into the chain or the unintentional pulling of clothes into the chain can cause crushing.
- Never touch a running chain or the chain inlets.
- Wear tight-fitting work clothing.

The re-lubrication intervals are to be set by the operating company depending on the exposure. The value indicated in the maintenance and inspection intervals (→ section 7.1, page 26) is for reference only. The lubricating condition of the chain must be checked before each start of work (→ section 6.1.1, page 20). Please contact us, if required. To lubricate the chain, proceed as follows:

1) Remove the chain.
2) Clean heavily soiled chains mechanically.
3) Apply lubricant over the entire length of the chain. Make sure that lubricant reaches the contact points of the chain links.

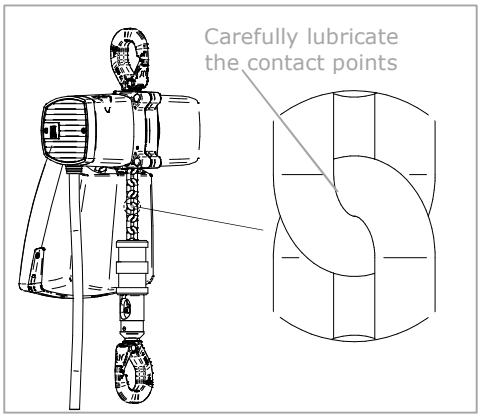


Fig. 20: Lubricating the chain

7.3.3 Lubricate motor

NOTICE
A dry-running motor leads to heavy wear and performance losses. Adhere to the specified relubrication intervals. Do not use too much lubricant. This can clog the motor and silencer and ultimately lead to a loss of performance or a malfunction.

The motor is lubricated via a grease nipple which is fixed in the rotor. The lubricant enters the motor through this. Lubrication can be carried out while the hoist is suspended. To lubricate the motor, proceed as follows:

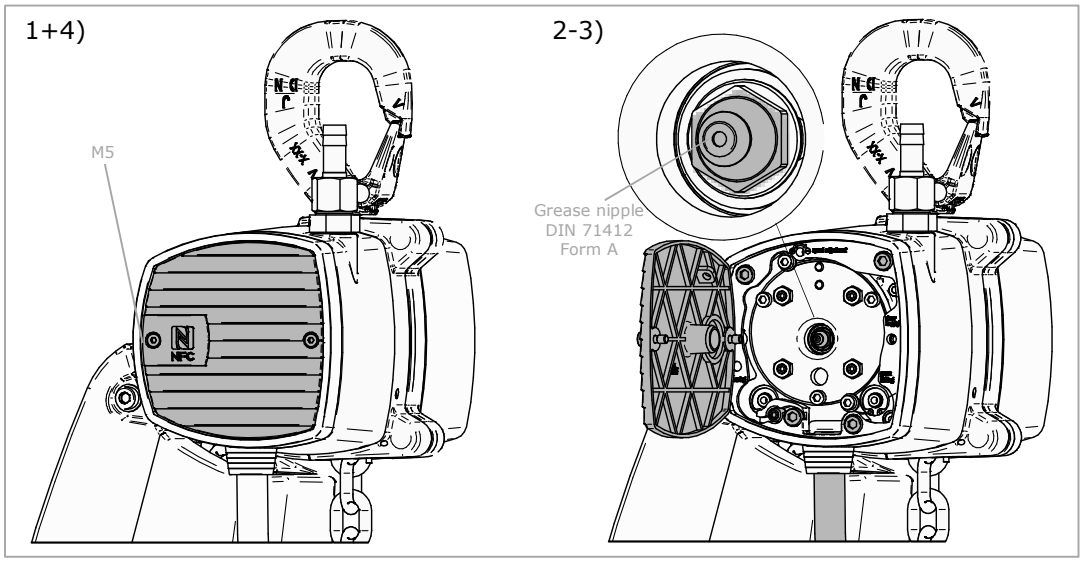


Fig. 21: Lubricate motor

1) Depressurise the hoist and remove the motor housing cover.
2) The motor housing cover is connected to the motor cover so that it cannot be lost. The grease nipple of the rotor is located in the middle at the top of the motor.
3) Fit a suitable adapter for the grease nipple and inject grease into the rotor until resistance is felt. This is an indication that the grease has reached the permeable discs in the rotor and the lubricant chambers are now completely filled again. Remove the adapter and remove excess grease from the rotor and surrounding components.
4) Refit the motor cover.
5) After lubricating the motor, run without load for approx. 20s so that the grease is distributed in the motor. During this period, the speed of the hoist may drop and the motor noise may change for a short time. The brake may also slip. This normalises after about 20s until the grease has spread.

7.4 Checking the brake with nominal load

⚠ **WARNING**
Danger from the load falling If the chain runs for an unusually long time after releasing the control elements, the brake may be defective. The load may fall. ➢ Do not use the hoist ➢ Have the hoist repaired

Checking of the brake is performed with a nominal load. Alternatively switch your hoist loaded with a nominal load to lifting and lowering
The brake has a response time that depends on the control length. A larger control length increases this response time. For physical reasons, however, the braking distance cannot have the value zero. For a control length of up to 8m, the chain must come to a standstill without noticeable delay after releasing the control elements.

7.5 Checking the chain

⚠ WARNING

Danger from chain fracture
If the chain of your hoist has one of the features listed below, the chain may break upon further use.
- ➢ Do not continue to use the hoist
- ➢ Replace chain

Features of a chain that must be discarded and replaced are:
- Corrosion pitting
- Bent or damaged chain links
- Chain drawn tight
- Wear over 11 pitches (dimension A)
- Single pitch wear (dimension B)
- Diameter reduction of a chain link (dimension C)
- Elongation of a chain link (dimension D)

Check the entire length of the chain. When checking the replacement limit, future wear up until the next inspection date must be taken into account.
If the chain dimension values are outside the limit values specified in the table when checked, the chain has reached its replacement limit and must be replaced by a new one. The chain sprockets must also be replaced together with the chain, as otherwise the new chain will be subjected to increased wear. Each chain replacement must be documented in the inspection log.

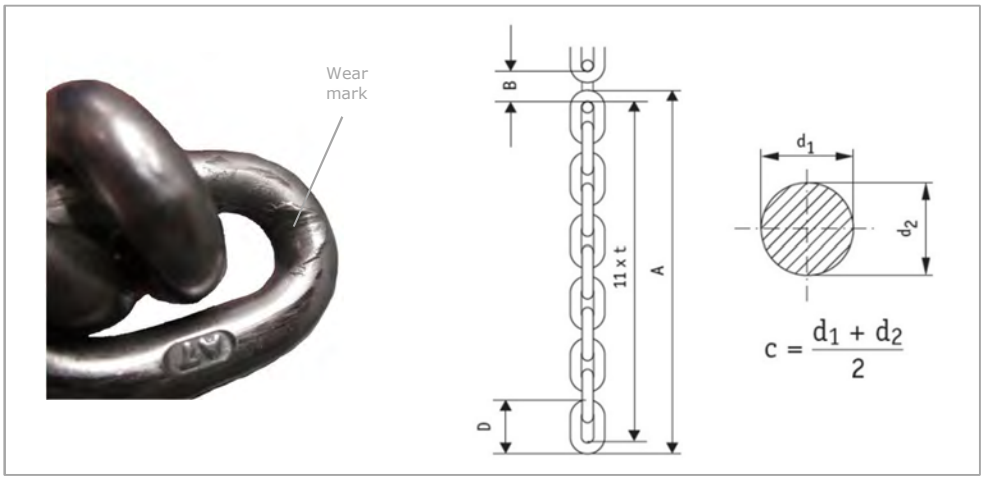


Fig. 22: Example for wear mark and check dimensions of chain

Type			mini 125/250	mini 500/1000
Dimension A	max.	mm	167,1	261,4
Dimension 11xt internal	max.	mm	158,3	247,2
Dimension B	max.	mm	14,9	23,2
Dimension C	min.	mm	4,2	6,7
Dimension D	max.	mm	23,7	37,4

Please observe the information contained in
→ DIN 685-5
→ ISO 7592

7.5.1 Replace chain

⚠ WARNING

Danger from chain fracture
The chain is subjected to impermissible stresses if the chain is twisted.
- ➢ Do not twist the chain!

NOTICE

Chains from JDN are matched to the chain sprocket in close tolerances. In order to ensure an optimum function of the chain and in order to prevent risks, only genuine JDN chains may be installed. Do not use chains measuring 4mm x 12mm, 5mm x 15mm (mini 125/250) or 7mm x 21mm (mini 500/1000)!

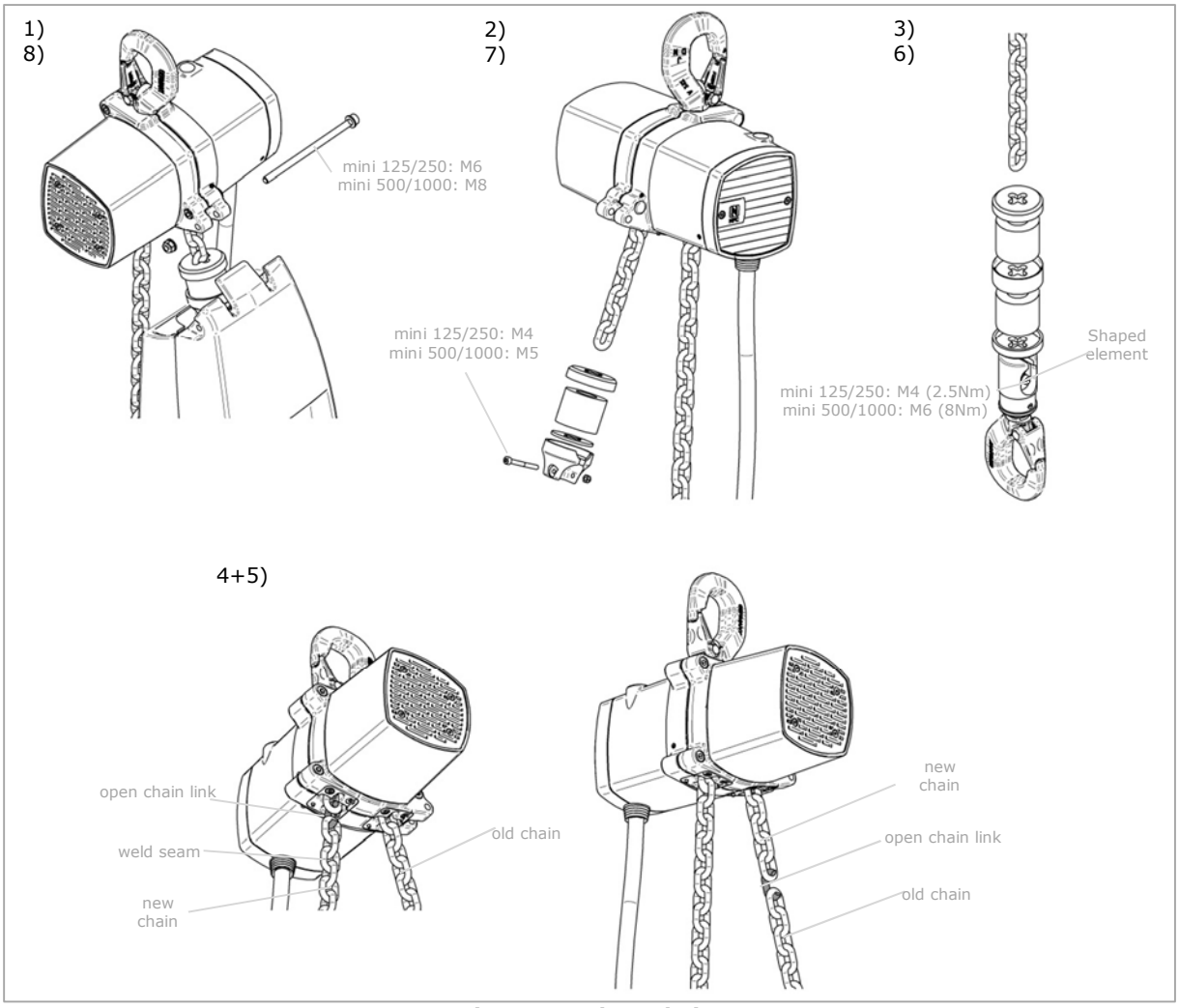


Fig. 23: Replace chain

1) Move the chain from the chain container to just before the lowering limiter and remove the chain container.
2) Disassemble the components on the idle chain:
    a. Undo the screw connection and remove the clamping piece.
    b. Detach the buffer discs and buffer from the chain.
3) Disassemble the components on the load chain:
    a. Undo the screw connection and remove shaped element.
    b. Remove the chain from the chain pocket of the load sleeve.
    c. Detach the buffer discs and buffer from the chain.
4) Attach the new chain to the end link of the load section of the old chain after aligning the welds by means of an open chain link. The welds on the upright chain links must face outwards when running over the chain sprockets.
5) Switch hoist to "lift" and run the new chain through the drive chain sprocket. After it exits, take the old chain and open chain link from the new chain.
6) Assemble the components on the load chain:
    a. Push the buffer discs (edge encloses buffer) and the buffer onto the chain.
    b. Insert the chain end link into the chain pocket of the load sleeve (ensure correct position of the weld seam).
    c. Insert the shaped element and tighten the screw connection.
7) Assemble the components on the idle chain:
    a. Push the buffer discs (edge encloses buffer) and the buffer onto the chain.

b. Insert the last chain end link into the chain pocket of the clamping piece and secure with a screw connection.

8) Fit the chain container and run the chain into the chain container.
9) The replacement of the chain for a new chain is to be entered in the inspection log.

7.6 Checking the chain inlet

⚠ CAUTION

Loss of function of lift cut-off
Excessive material removal of wear parts at the chain inlet can damage the shut-off valve for the lifting and lowering function.

- To minimise wear, ensure that the chain can always align itself under load.
- Regularly check the wear of the wear parts.

NOTICE

Due to excessive material removal of the wear parts at the chain inlet, the chain runs inaccurately over the chain wheel. This leads to increased wear on the chain and sprocket.

The chain inlet on the load chain side is subject to much greater wear than that on the idle chain side. For this reason, the inspection interval is shorter. The chain container must be dismantled for checking the chain inlet on the idle chain side (→Fig. 24: Checking the chain inlets).

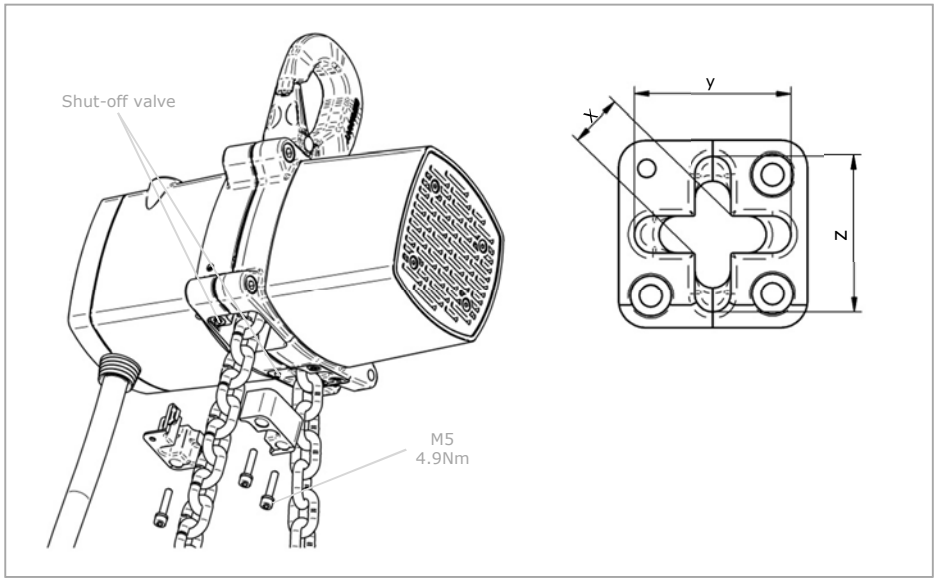


Fig. 24: Checking the chain inlets

1) Depressurise the hoist! To make checking easier, it is advisable to remove the chain inlets from the hoist. To do this, undo the three screws (make sure that the shut-off valve does not fall out!).
2) After disassembly, the chain inlets must be pressed together to determine the wear dimensions.
3) Check the chain inlets on the load and the idle chain side. Determine the dimensions on the chain inlet side. If any of the dimensions listed below are exceeded, replace the chain inlets (→ spare parts list)
4) Reassemble the chain inlets.
5) Check that the shut-off valves on the load chain side and the idle chain side are working (→ section 6.1.4 and 7.8).

Type			mini 125/250	mini 500/1000
X	max.	mm	11	18
Y	max.	mm	27	43
Z	max.	mm	27	43

7.7 Checking the hook

⚠ CAUTION

Loss of load capacity of the hooks
Excessive material removal or excessive expansion of the load hook or support hook can lead to a loss of load capacity.
- Check for wear regularly.

If one of the test dimensions of the load or support hook is outside a limit value, the hook must be replaced.

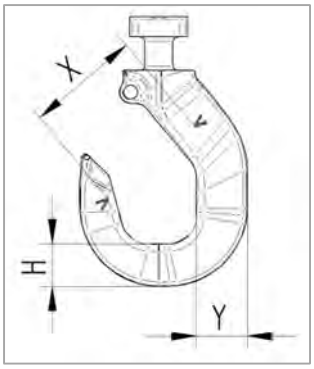


Fig. 25: Checking the hook

Type			mini 125/250	mini 500/1000
X	max.	mm	40,9	60,9
Y	min.	mm	16,0	27,0
H	min.	mm	14,0	28,0

7.7.1 Checking axial clearence

NOTICE

Depending on actual application (frequent rotation) the wear may be higher than usual at rotating top hooks. The inspection interval is to be reduced accordingly.

The axis clearance of the hooks shall not exceed the wear limit of Y_{max} = 0,5mm (measured using a thickness gauge, → Fig. 26). The initial clearance A_0 and B_0 shall be documented on initial operation.

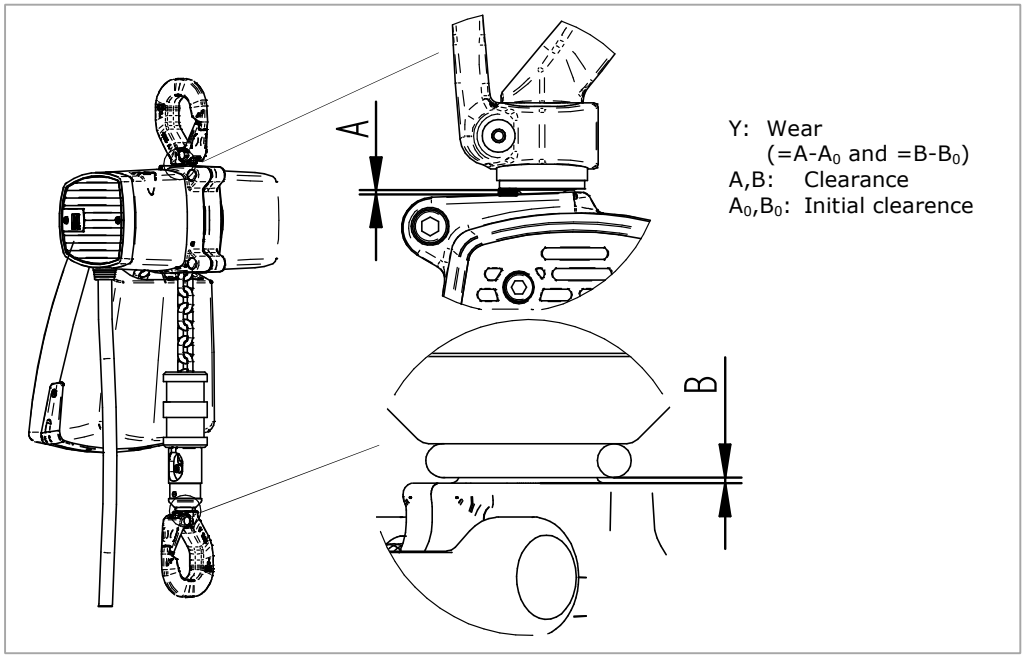


Fig. 26: Checking axial clearence

Date	Top hook		Load hook	
	A [mm]	Y [mm]	B [mm]	Y [mm]
	-	$Y=A-A_0$		$Y=B-B_0$
Initial operation:	A_0=___	0,0	B_0=___	0,0
1. Check:				
…				

Top hook: By reaching the wear limit of Y > 0,5mm the gliding surfaces on hook, engine housing and centre part are to be controlled. Only flat and unruffled surfaces are fit for further operation. The wear washer is to be exchanged by a new one.

Load hook: If the axial clearance of the installed load or support hook exceeds the specified maximum play, the worn parts must be replaced.

7.8 Checking the chain box and lowering limiter

⚠ WARNING

Chain crash due to damaged chain container
A chain container damaged by a crack can cause the chain to break and then fall off.
- Check the chain container regularly for cracks.

⚠ WARNING

Chain breakage due to damaged lowering limiter
A damaged lowering limiter (non-functioning shut-off valve and/or damaged buffer) can lead to unacceptably high loads on the chain. The chain may break.
- Check the function of the shut-off valve regularly.
- Check the condition of the buffer regularly.

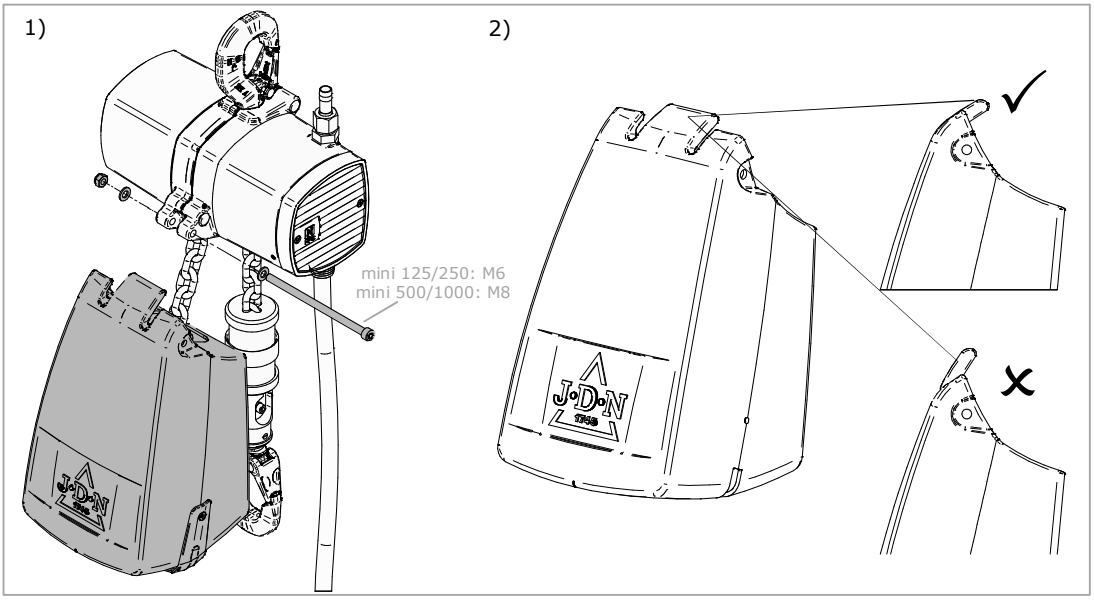


Fig. 27: Checking the chain box and lowering limiter

1) Disassemble the chain box.
2) Inspect the chain box visually for cracks and check the bending of the clamping plate. The permissible maximum amount of bending must not be exceeded.
3) Check the buffer of the lowering limiter visually for cracks and damage (comparison → Abb. 14, page 21)
4) Drive in the lowering limiter. The motor must switch off automatically and stop the movement of the chain if the switch-off valve is switched by the buffer disc. It is only possible to move it in the opposite direction until the relevant end position has been left. Following successful testing, the buffer must be unloaded.
5) Replace the chain box.

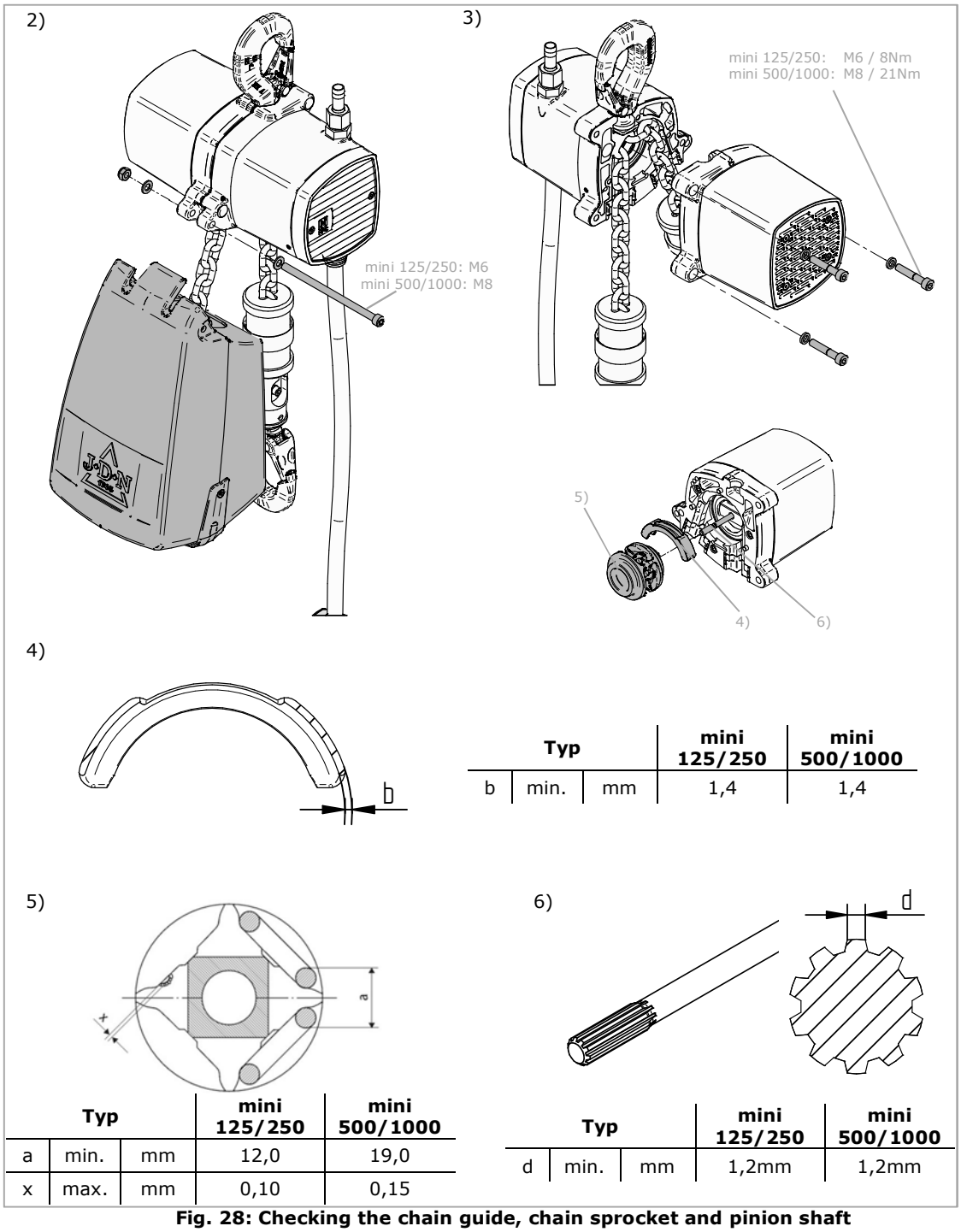
7.9 Checking the chain guide, chain sprocket and pinion shaft

⚠ WARNING

Danger from the load falling
A damaged pinion and rotor gearing can reduce the load capacity of the hoist and lead to a load falling.
- Check the gearing regularly.
- Never allow the minimum dimensions to be undershot.

⚠ WARNING

Danger from chain fracture
The chain is subjected to impermissible stresses if the chain is twisted.
- Do not twist the chain when reassembling the hoist!



Typ			mini 125/250	mini 500/1000
b	min.	mm	1,4	1,4

Typ			mini 125/250	mini 500/1000
a	min.	mm	12,0	19,0
x	max.	mm	0,10	0,15

Typ			mini 125/250	mini 500/1000
d	min.	mm	1,2mm	1,2mm

Fig. 28: Checking the chain guide, chain sprocket and pinion shaft

1) Place the hoist on a workbench (see section 4.1.1, page 14).
2) Disassemble the chain box.
3) Loosen the three screws and separate the motor and gearbox.
4) Remove and check the wear dimensions of the chain guide.
5) Remove and check the wear dimensions of the chain wheel.
6) Check the toothing of the pinion shaft. The toothing must not be obviously damaged and the specified minimum dimension must not be undershot.
7) Fit the chain sprocket with chain and the chain guide. Pay attention to the alignment of the chain. The weld seams of every second chain link must run on the outside of the sprocket. The chain sprocket must be inserted into the gearbox so that the motor can be pushed onto the gearbox.
8) Push the rotor onto the pinion shaft and connect the motor to the gearbox.
9) Fit the chain box.

7.10 Checking the vanes and brake lining

⚠ CAUTION

Risk of injury from pre-tensioned springs
Pre-tensioned springs are released when disassembling the motor or brake cover.
- ➢ Carefully loosen and remove the motor cover!

To check the vanes and brake lining, the motor unit must be removed from the motor and disassembled. This can be done while the hoist is suspended.

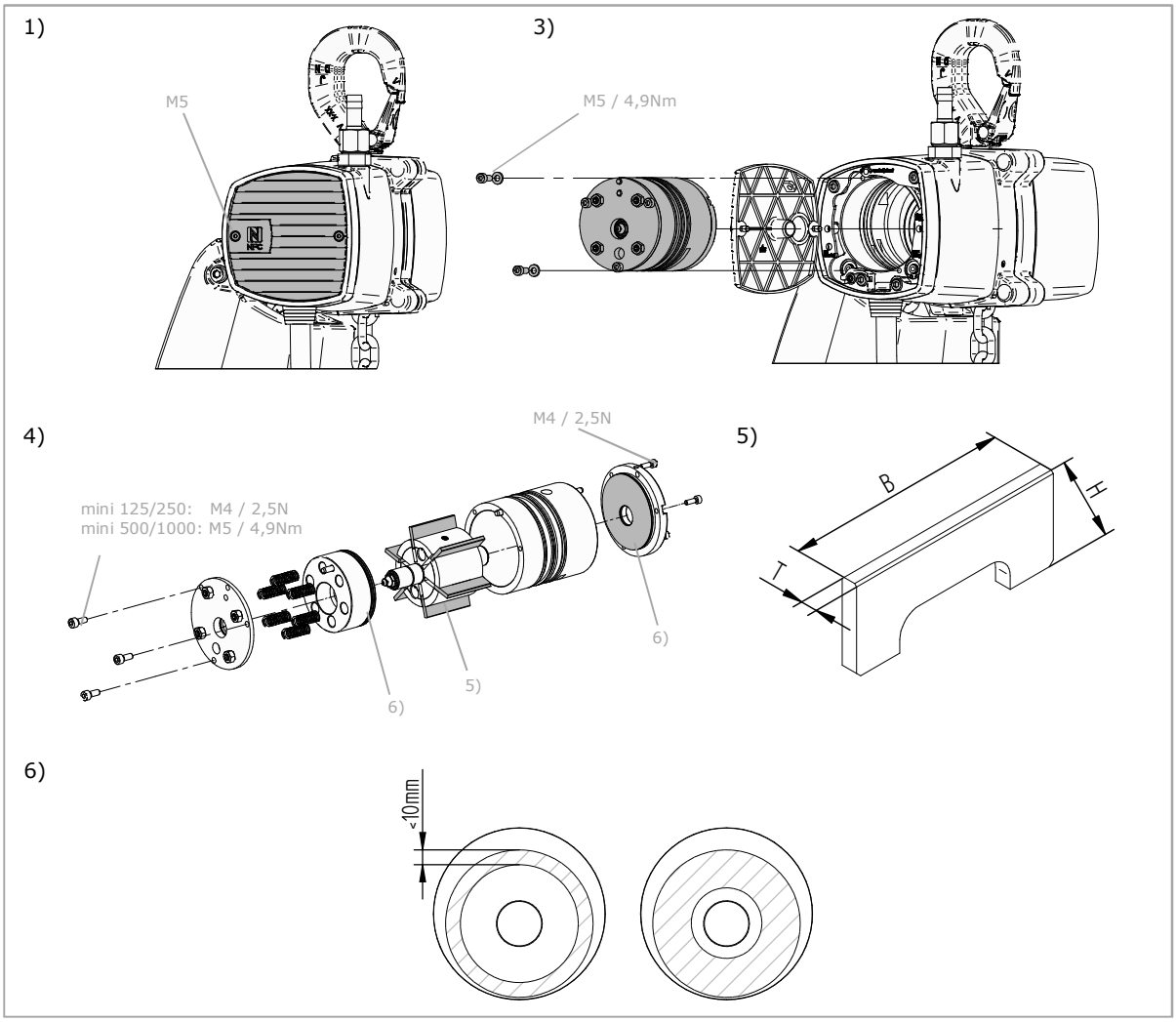


Fig. 29: Checking the vanes and brake lining

1) Depressurise the hoist and remove the motor housing cover.
2) Due to the smoothness of the hoist gearbox, the load hook can lower slowly and automatically by pulling the motor unit when the braking effect is released. Secure the chain against running off by inserting a screw into the chain end link on the hoist body and into the idle chain.

3) Undo the three fastening screws and pull the motor unit out of the motor and place it on a workbench.
4) Remove the two motor and brake covers and pull the brake piston and rotor out of the cylinder liner.
5) Checking vane wear: When the vanes are worn, the motor power and consequently the lifting performance are reduced. Replace the vanes and starting aids together.

Type			mini 125/250	mini 500/1000
H	min.	mm	12,8	19,0
B	min.	mm	34,0	49,5
T	min.	mm	2,5	3,4

6) Check for brake wear: The wear pattern in the braking surfaces must only be ring-shaped. With a circular wear pattern, the permissible brake wear is exceeded and the motor unit must be replaced. The extremely low-wear braking material will not reach the wear limit within the design-dependent service life of the hoist, under intended use. Should the wear limit be reached prematurely, the actual compressed air pressure must be checked with the device switched on (the brake drags in the event of insufficient pressure).
7) Push the rotor and brake piston back into the cylinder liner. Position the springs and tighten the motor and brake covers.
8) Push the motor unit into the motor and secure it with the three fastening screws. Remove the chain link.
9) Mount the motor housing cover.

7.11 Checking the silencer

NOTICE
In addition to the scheduled inspection intervals, the silencer should be inspected and its flow resistance assessed whenever the hoist fails to reach the specified lifting speed.

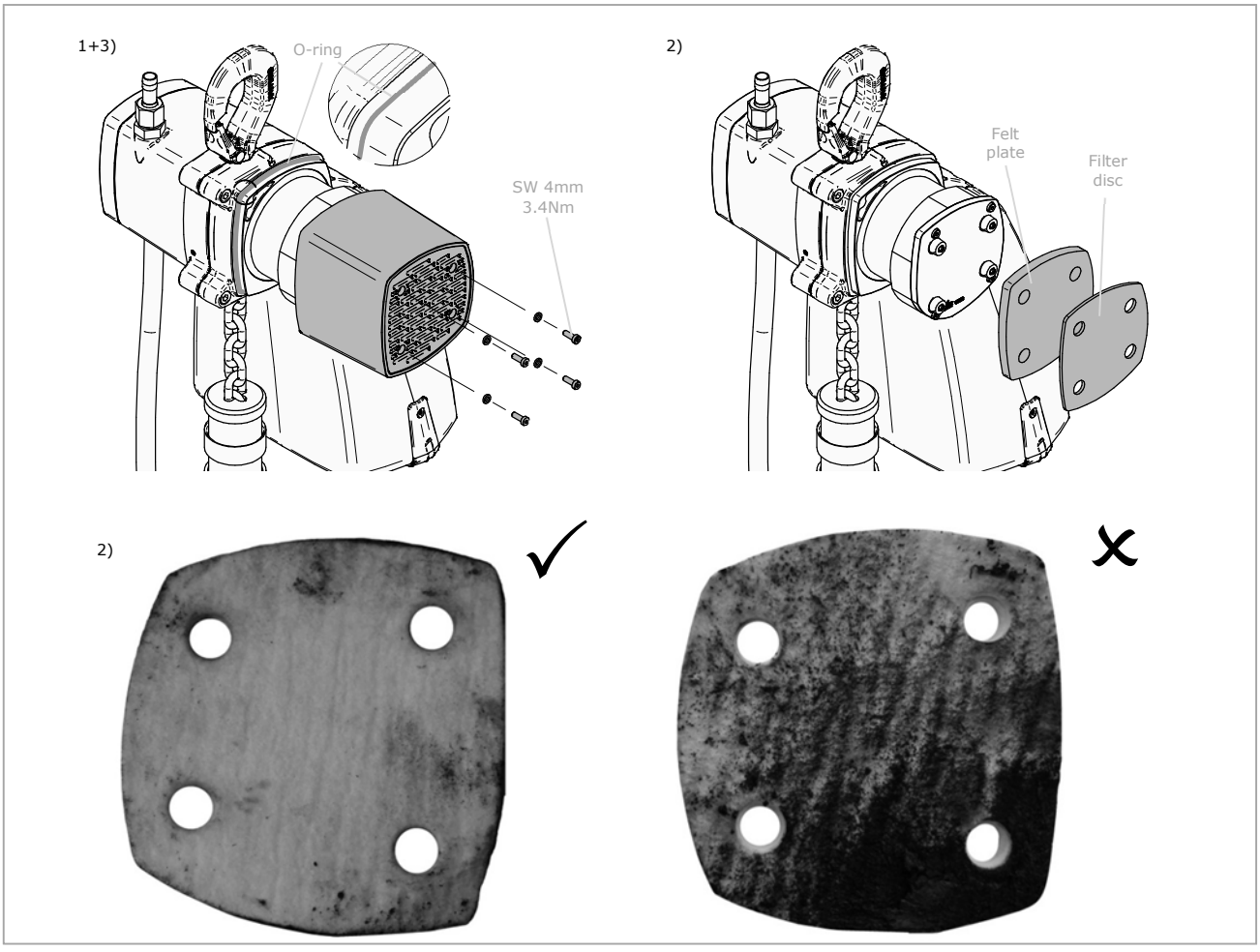


Fig. 30: Checking the silencer

1) Depressurise the hoist and remove the gearbox housing. A strong pull on the gear housing may be necessary.
2) Examine both the felt plate and the filter disc. In case of coarse soiling or blockage, replace both elements (→ spare parts list).
3) Reassemble the gearbox housing. The gearbox housing must be pressed flush against the centre part before the fastening screws can be tightened. Make sure that the O-ring is seated correctly.

7.12 Checking the gear lubrication

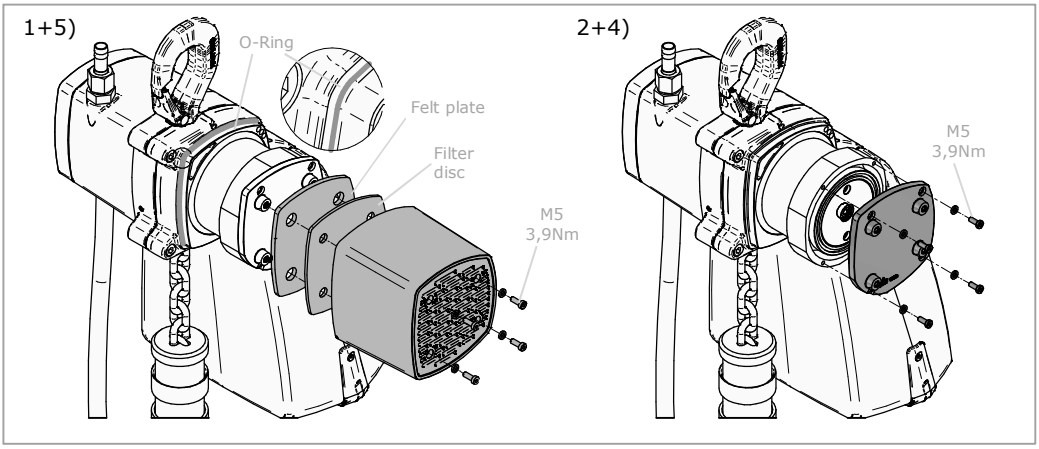


Fig. 31: Checking the gear lubrication

1) Depressurise the hoist and remove the gearbox housing. A strong pull on the gear housing may be necessary. Also remove the felt plate and filter disc.
2) Undo the gearbox cover.
3) Check whether the toothing are still well lubricated. The teeth must be completely covered with a thin lubricating film. If this is not the case, lubricate the toothing (lubricants → section 7.3.1, page 28).
4) Attach the gearbox cover.
5) Reassemble felt plate, filter disc and gearbox housing. The gearbox housing must be pressed flush against the centre part before the fastening screws can be tightened. Make sure that the O-ring is seated correctly.

8 FAULTS, CAUSES AND REMEDIES

Lifting / lowering not possible or only possible very slowly

Possible cause	Remedy
Insufficient inlet pressure	Increase inlet pressure to the required value.
Input volume too low	Ensure sufficient volume.
Cross section of the supply line too small	Use line with sufficient cross section.
Emergency stop button pressed	Release the emergency stop button when the danger has been eliminated.
Limit stop disables the power supply	Drive in the opposite direction.
Supply hoses leaking or loose	Check connections.
Motor has run dry	Lubricate motor.
Silencer is clogged	Replace or clean silencer elements, improve air quality if necessary.
Motor vanes worn	Replace motor vanes.
Brake does not release fully	Bring the inlet pressure to the required value, check the brake piston seal and replace the seal if necessary. Check adjustment of brake piston.
Hand control is faulty	Have the hand control repaired.
Speed throttle set low	Check speed throttle

Sensitivity of the hoist decreases

Possible cause	Remedy
Dry control piston of main air valve, lifting valve and lowering valve	Relubricate the valve pistons.

Lifting and lowering speed declines with higher lifting heights or motor stops

Possible cause	Remedy
Brake opening pressure too low – grinding brake	Check compressed air supply

Loud noise at the chain sprocket or gearbox

Possible cause	Remedy
Chain dry	Lubricate the chain. Check wear.
Chain sprocket worn	Replace chain sprocket, check chain guide/chain inlets and replace if necessary.
Chain worn	Check wear. Replace chain with a new JDN chain.
Wrong chain drawn in	Identify chain and replace with JDN chain if necessary.
Defective gearbox / bearing	Have the hoist repaired.

Excessive running on during braking

Possible cause	Remedy
Brake cover and/or brake piston worn	Replace brake cover and/or brake piston.
Motor freshly lubricated	Move the hoist without load until the fresh grease has spread.

Chain box is knocked out

Possible cause	Remedy
Chain box is bent / damaged	Replace chain box

9 DECOMMISSIONING

9.1 Disassembly

⚠ CAUTION

Risk of explosion
- Observe the national regulations and work instructions at your workplace when carrying out assembly, maintenance and disassembly work in explosion-hazardous areas.

⚠ CAUTION

Danger from faulty disassembly
Improper disassembly can lead to injuries.
- The hoist may only be dismantled by qualified personnel.

1) Depressurise the power supply.
2) Provide a suitable working platform.
3) Remove the hose.
4) Carefully detach the hoist and transport it away.

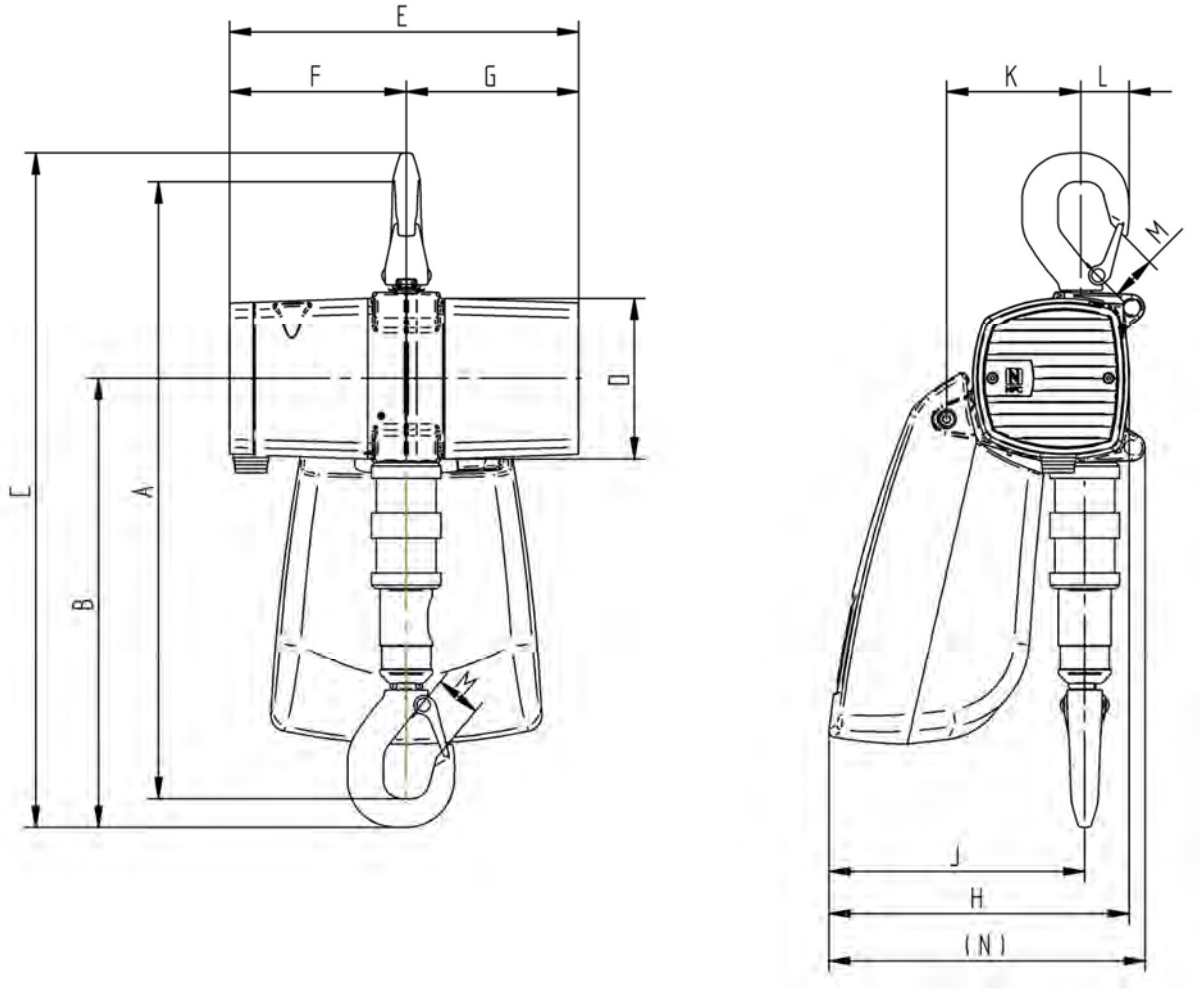
9.2 Disposal

The hoist contains a range of materials which, on expiry of the service life, must be disposed of or recycled where appropriate, in accordance with statutory regulations. Please note the following list of materials used:

- Ferrous materials: Steel, spheroidal graphite iron
- Non-ferrous metals: Aluminium, brass
- Plastics: Polyethylene, polyamide, POM, polyurethane, elastomer resin bonded
- Other: Wool felt

10 APPENDIX

10.1 Dimensions



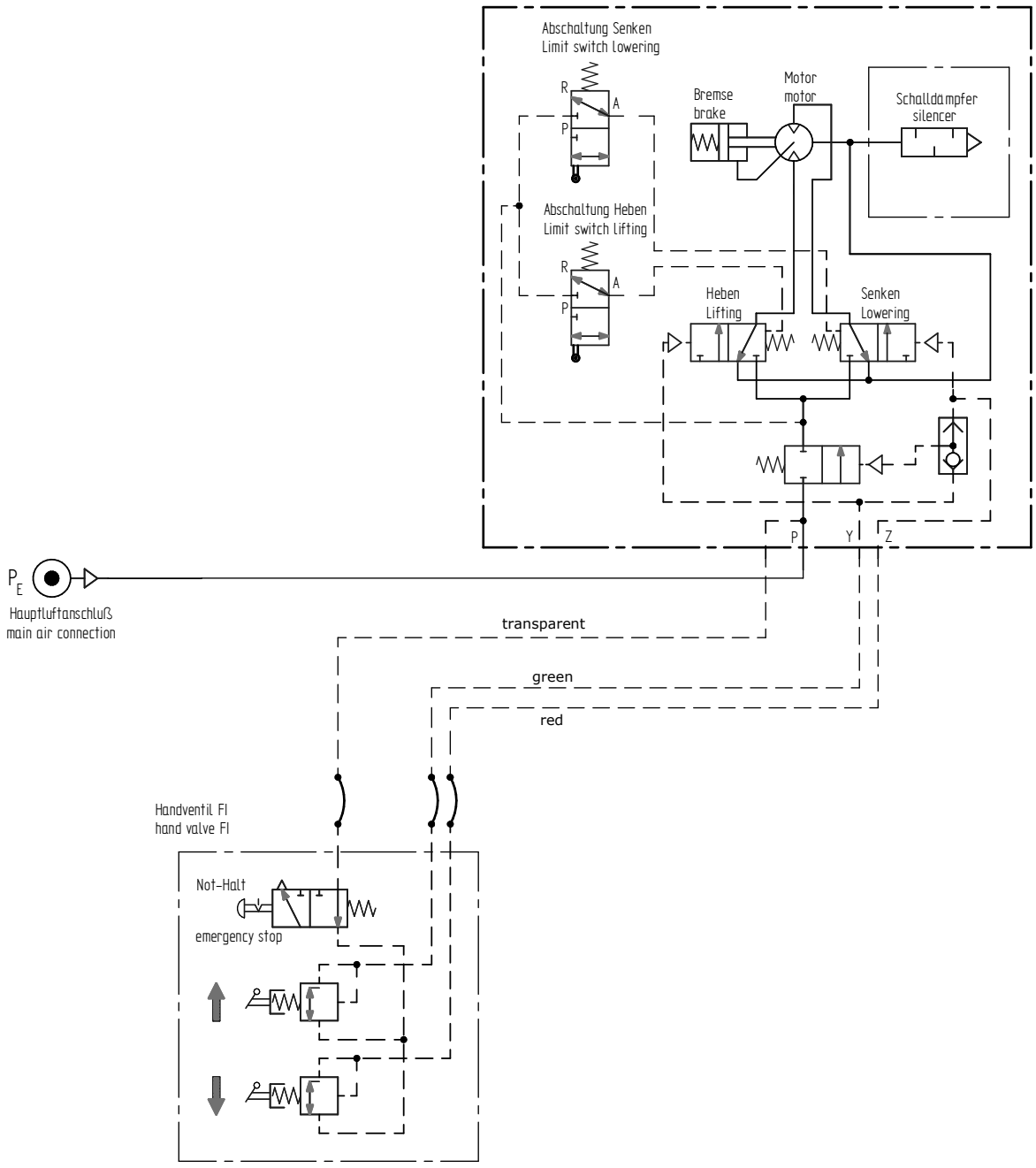
Type		mini 125/250	mini 500/1000
A*	mm (inch)	370 / 422 (14.57 / 16.61)	510 / 542 (20.08 / 21.34)
B*	mm (inch)	252 / 277 (9.92 / 10.91)	370 / 399 (14.57 / 15.71)
C*	mm (inch)	401 / 452 (15.79 / 17.80)	557 / 619 (21.93 / 24.37)
D	mm (inch)	100 (3.94)	135 (5.31)
E	mm (inch)	220 (8.66)	292 (11.50)
F	mm (inch)	112 (4.41)	148 (5.83)
G	mm (inch)	108 (4.25)	144 (5.67)
H	mm (inch)	191 (7.52)	252 (9.92)
J	mm (inch)	165 (6.50)	213 (8.39)
K	mm (inch)	81 (3.19)	122 (4.80)
L*	mm (inch)	28 (1.10)	41 (1.61)
M*	mm (inch)	19 / 24(0.75 / 0.94)	28 / 36 (1.10 / 1.42)
N	mm (inch)	203 (7.99)	264 (10.39)

* hook with safety catch / hook with twist-lock safety device

10.2 Technical data

Type		mini 125	mini 250	mini 500	mini 1000
Load capacity	kg (lbs)	125 (275)	250 (550)	500 (1100)	980 (2200)
Nominal pressure	bar (psi)	6 (87)			
Number of chain sections	-	1			
Weight with 3m lift	kg (lbs)	10 (22)		10 (22)	
Chain	mm	4,7x14,1 DAT		7,4x22 DAT	
Weight per m (ft) chain	kg (lbs)	0,48 (0.32)		1,19 (2.62)	
Air consumption when lifting the nominal load	Nm³/min (cfm)	0,95 (33.5)		1,7 (60.0)	
Air consumption when lowering the nominal	Nm³/min (cfm)	0,95 (33.5)		1,7 (60.0)	
Main connection	-	G1/2"			
Motor power	kW	0,45		1,0	
Lifting speed at nominal load	m/min (ft/min)	20,0 (65.6)	10,0 (32.8)	12,5 (41.0)	6,3 (20.6)
Lifting speed without load	m/min (ft/min)	40,0 (131.2)	20,0 (65.6)	20,0 (65.6)	11,5 (37.7)
Lowering speed at nominal load	m/min (ft/min)	40,0 (131.2)	20,0 (65.6)	20,0 (65.6)	12,0 (39.3)
Lowering speed without load	m/min (ft/min)	25,0 (82.0)	12,5 (41.0)	13,0 (42.6)	7,5 (24.6)
Sound pressure level when lifting the nominal load	dB(A)	78	78	78	78
Sound pressure level when lowering the nominal load	dB(A)	80	80	80	80

10.3 Flow sheet



APPENDIX

EC/EU Conformity Declaration
(Original Conformity Declaration)

We, J.D. Neuhaus GmbH & Co. KG, 58449 Witten, Germany, hereby declare that the
Compressed air hoist: JDN mini
Serial no.: Nxxxxxx
in the version supplied conforms to all applicable provisions of the following EC/EU Directives:

// 2006/42/EC, EC Machinery Directive
// 2014/34/EU, ATEX Directive

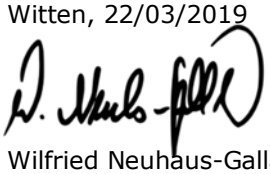
Directive 2006/42/EC, Machinery Directive
The conformity assessment procedure was carried out following Directive 2006/42/EC according to Article 12 (2). Mr Helmut Stahnke, J.D. Neuhaus GmbH & Co. KG, 58449 Witten, is authorised to compile the technical documentation for the above machine within the meaning of 2006/42/EC.

2014/34/EU, ATEX Directive
The devices described above may be used in explosion hazardous areas on the basis of European Directive 2014/34/EU. This is indicated on their nameplate according to their technical capabilities. The conformity assessment procedure was carried out according to Directive 2014/34/EU Article 13 (1) b) ii).

Identification in accordance with Directive 2014/34/EU: Ex II 3 GD IIA T4(X)

Applicable harmonised standards, in particular:
DIN EN 14492-2:2010 // DIN EN 13463-1:2009 // DIN EN 13463-5:2011 // DIN EN 1127-1:2017 // DIN EN ISO 9001:2015

Witten, 22/03/2019



Wilfried Neuhaus-Galladé / Management

Declaration for Incorporation of Completed Machinery
(Original Declaration of Incorporation)

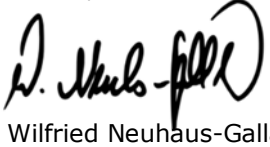
We, J.D. Neuhaus GmbH & Co. KG, 58449 Witten, Germany, hereby declare that the
Compressed air hoist: JDN mini
Serial no.: Nxxxxxx
corresponds to the fundamental requirements of the EC Machinery Directive 2006/42/EC, as far as is applicable for the scope delivered.

The special technical documentation was compiled in accordance with Annex VII, Part B of the EC Machinery Directive 2006/42/EC. J.D. Neuhaus undertakes, on justifiable request, to make the special technical documentation available in electronic form to individual national authorities.
Mr Helmut Stahnke, J.D. Neuhaus GmbH & Co. KG, Windenstraße 2-4, 58455 Witten, is authorised to compile the technical documentation for the above machine.

This declaration only concerns the partly completed machinery described above!
The partly completed machinery can only be put into operation when it has been established that the machine in which partly completed machinery is to be incorporated corresponds to the provisions of the EC Machinery Directive 2006/42/EC.

Applicable harmonised standards, in particular:
DIN EN 14492-2:2010 // DIN EN ISO 9001:2015

Witten, 22/03/2019



Wilfried Neuhaus-Galladé / Management