

**JDN OPERATION AND ASSEMBLY
INSTRUCTIONS *mini* AIR HOISTS**



Original Operation and
Assembly Instructions



J.D. NEUHAUS
powered by air!

This operation manual edition 8/2010,
covers the following JDN MINI Air Hoists:

mini 125

Fabr. No.

mini 250

Fabr. No.

Please enter the Fabr. No. of your
JDN Air Hoist here.

mini 500

Fabr. No.

mini 1000

Fabr. No.

It must be read carefully and in its entirety
before operating any MINI air hoist.
For hoists installed in trolleys, refer also to
the **JDN Trolleys** Operation Manual.



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Please note:

Within the Federal Republic of Germany operators of air hoists must comply with trade association accident prevention regulations and rules, as well as state occupational safety regulations, in particular

- ▶ BGV A1 accident prevention regulations "Principles of Prevention"
- ▶ BGV D8 accident prevention regulations "Winches, Lifting and Pulling Devices"
- ▶ BGR 258 trade association regulations "Operation of Load-Carrying Devices Used with Lifting Equipment"

and, for air hoists installed in trolleys and for the operation of monorail hoists, additionally with

- ▶ BGV D6 "Accident Prevention Regulations for Cranes"

in the respective currently applicable version. Operators must also initiate the prescribed tests (see also "Principles for the Testing of Cranes" BGG 905 (ZH 1/27)).

To document the tests we recommend the "Inspection log for cranes" BGG 943 (ZH 1/29) from the trade association.

When operating air hoists in areas with explosive atmospheres, the operator must comply with the relevant explosion protection regulations, e.g.

- ▶ BGR 104 "Explosion Protection Regulations" and
- ▶ BGR 132 "Prevention of Ignition Hazards due to Electrostatic Charges"

In all other countries, the operator shall comply with local regulations as applicable.

Special regulations may apply when incorporating air hoists into other installations or using air hoists under unusual conditions.



SAFETY INSTRUCTIONS

ORGANISATIONAL MEASURES

JDN Hoists are designed in accordance with current technological standards and accepted safety practice. Nonetheless, the use of an air hoist may be associated with risk of injury or fatality to the user or to third parties or with the risk of damage to the hoist or to other items, if safety rules are disregarded.

All personnel charged with operating air hoists, must have read and understood the operation manual, especially the section entitled "Rules for the safe operation of hoists", before commencing work.

This is particularly important for personnel who only occasionally operate the hoist, e.g. for maintenance or retrofitting work.

Operators of JDN Hoists are also under obligation to ensure safe and hazard-free operation. This can be achieved through the following measures:

- ▶ keep the operation manuals available at the hoist operating site,
- ▶ performing regular training,
- ▶ Perform regular inspections (at least once annually),
- ▶ implement an inspection log and make regular entries,
- ▶ and regularly check personnel for safety and hazard awareness during work.

PERSONNEL SAFETY

Personnel who operate, maintain, inspect and perform setting-up work on the hoist must be properly trained or must receive an introduction from properly trained personnel, before commencing work.

Due to their technical training and experience, properly trained personnel have adequate knowledge of hoists. They are sufficiently familiar with the relevant occupational safety and accident prevention regulations that they are able to assess the condition of hoists with regard to working safety.

- ▶ Follow the operating instructions for your workplace.
- ▶ Comply with the accident prevention regulations.
- ▶ Ensure that you are properly informed regarding working with hazardous materials.
- ▶ Follow the safety instructions set out in the operation manuals.

PREVENTING PROPERTY DAMAGE

Operators of JDN Hoists are under obligation to ensure that entries in the accompanying inspection log are made properly and regularly.

- ▶ Comply with the prescribed maintenance intervals.
- ▶ Only use JDN hoists for work which is described as intended use.
- ▶ Observe the operating conditions for JDN Hoists as described in this manual.



PRODUCT INFORMATION

THE OPERATION MANUAL

This operation manual is intended to help the operator to become familiar with JDN air hoists and their intended use.

This operation manual contains important information for the safe, proper and efficient operation of JDN Air Hoists. Observance of the manual helps to avoid hazardous situations, to reduce repair costs and downtimes and to ensure the specified service life of the JDN Air Hoists.

WARNINGS AND SYMBOLS

Safety warnings in this operation manual are classified in three categories:



DANGER!

Safety warnings, which if not followed can result in hazard to life and limb, are indicated by this symbol.

The symbol indicates an immediate danger. The possible consequences of non-observance may be severe or even fatal injuries.



CAUTION!

This symbol indicates potentially hazardous situations. Failure to observe may result in light injuries.



ATTENTION!

This symbol indicates that failure to follow the relevant instructions may result in damage to the hoist or other equipment.



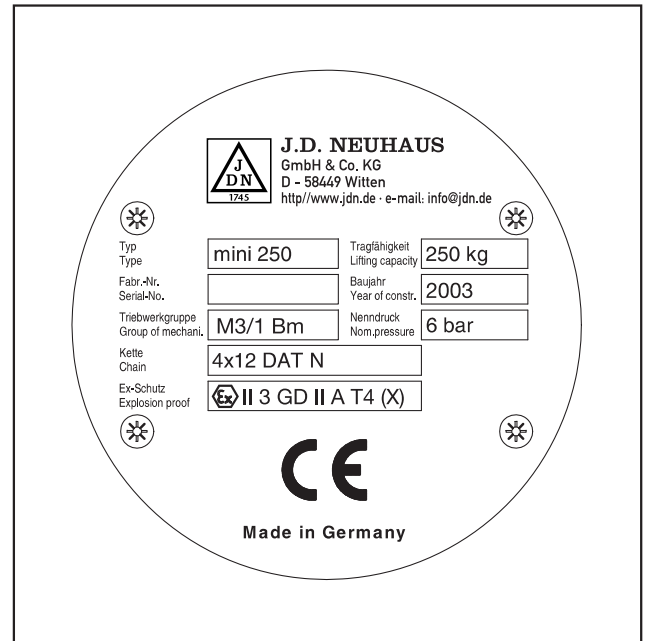
LABELLING

The nameplate mounted on the housing cover identifies the type of JDN Air Hoist and contains all important rating data.

If you have any questions concerning operation of JDN Air Hoists, which are not addressed in this operation manual, please contact us at the following address:

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 Windenstraße 2-4
 D - 58455 Witten-Heven

Phone +49 2302 208-0
 Fax +49 2302 208-286
 www.jdn.de
 e-mail: info@jdn.de



Example of nameplate on housing cover



ASSEMBLY OVERVIEW

MINI series air hoists consist of the following assemblies:

- 1 Motor
- 2 Gearbox with chain drive
- 3 Controls
- 4 Chain and hook
- 5 Chain box

PRODUCT DESCRIPTION

MINI series JDN Air Hoists are chain air hoists for load-carrying capacities of 125 kg, 250 kg, 500 kg and 980 kg in the EU version. Outside of the EU the maximum load-carrying capacity is 1000 kg. All models lift using a single chain. They are equipped with direct controls and an EMERGENCY STOP device.

Loads can be moved and positioned with precision. The highest and lowest load hook position is limited by buffers (emergency end stop).

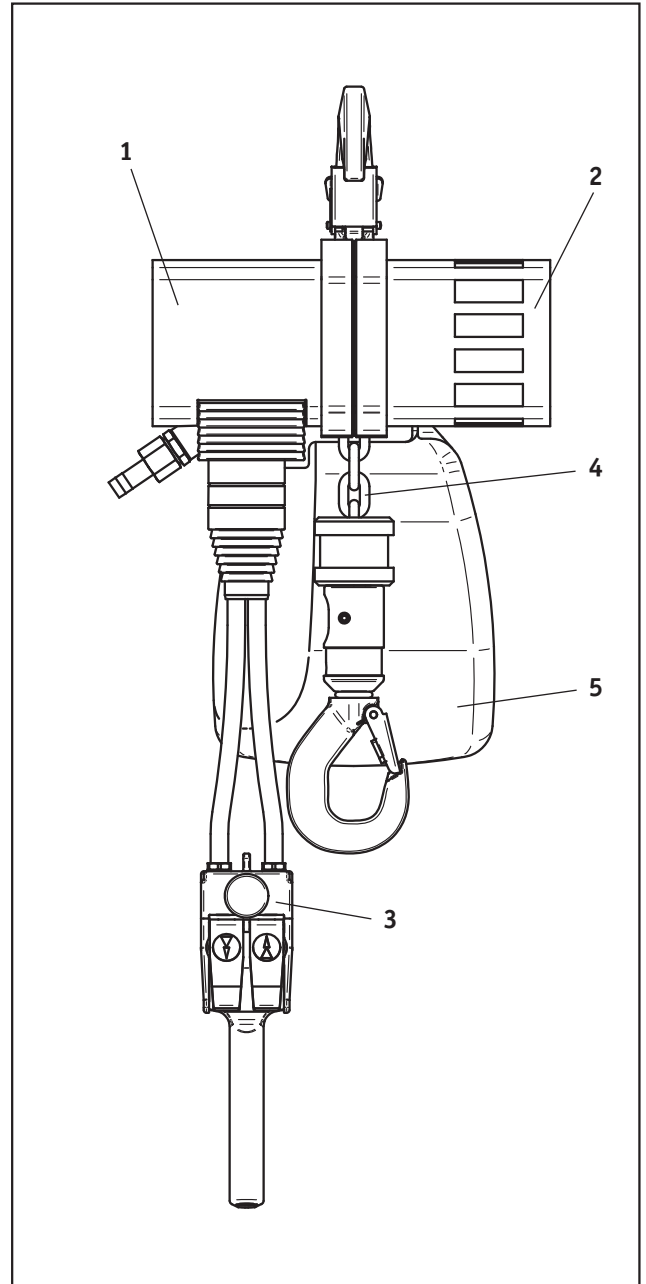


DANGER!

Hook travel limit buffers are for emergency use only, repetitive impact of buffers is not allowed! Operator must monitor hook travel to prevent impact of the buffer against the hoist body.

JDN MINI Air Hoists conform to driving mechanism classification 1 Bm in accordance with FEM, corresponding to M3 as per ISO.

The motors for the JDN MINI air hoists are treated during installation with a JDN high-performance grease (Art. No. 11901). This grease enables operation with oil-free compressed air. It remains effective for an operating period of approx. 100 hours and should be renewed after five years, at the latest (see **Motor lubrication**, page 17). Additional lubrication with oil-bearing compressed air by means of a service unit with oiler is possible.



MINI series JDN Air Hoist



EXPLOSION PROTECTION

The basis for the following information is an expert statement by the DMT Gas & Fire Division on the use of JDN Hoists, Trolleys and Crane Systems in explosion-hazardous areas, based upon European Guideline 94/9/EC¹ ("ATEX 100a"). DMT is accredited with the testing of devices and protection systems for intended use in explosion-hazardous areas.

MINI type JDN Air Hoists are category 3 devices for general industrial use and for use in zone 2 for gases of explosion group IIA. They are also suitable for use in zone 22 for dusts, provided that no light metal or other impact-sensitive dusts are present.

They are designated by  **II 3 GD IIA T4(X)**

ADDITIONAL MARKING "X"

This designation refers to explosion protection details in the operation manual.

II 3 GD IIA T4(X):

This designation does not permit use in the presence of light metal or other impact-sensitive dusts, or in the presence of dusts with glow temperatures below 210° C or ignition temperatures below 202° C. The permissible ambient temperature range (Ta) extends from - 20° C to + 50° C.

MATERIALS FOR FRICTION AND IMPACT HAZARDS

Impacts between particular materials result in an increased ignition hazard. This does not apply to corrosion-resistant steel or cast iron against aluminium, magnesium or corresponding alloys. It applies in particular to the presence of rust or of rust film. Rust (also rust film) formation is possible, especially on the chain and on the load hook, at the friction points. The following holds true for all zones: For the intended use of hoists it must be ensured that no rust is present at the above-mentioned friction points and that material combinations of the above-named light metals with steel (exception being stainless steel) or cast iron are not used in the working area of the hoists, at potential friction, impact or sliding points.

It is thus possible to exclude sparking due to mechanical influences with these material combinations.

The external housing of the service units is made of aluminium. Therefore the installation position is to be selected so as to ensure that there is no risk from impact sparks.

CLEANING PLASTIC SURFACES

Where JDN Air Hoists or JDN Air Winches feature plastic parts, these surfaces must only be cleaned using a damp cloth (cleaning cloth with water). This reduces electrostatic charging that can arise due to mechanical friction at the plastic surface.



DANGER!

Electrostatic charging may occur at the plastic surfaces, potentially leading to electrostatic discharge that can ignite gases and air mixtures.



EXPLOSION GROUPS AND TEMPERATURE CLASSES OF THE MOST IMPORTANT GASES AND VAPOURS (-SELECTION)
(in accordance with DIN VDE 0165⁶, Redeker⁷, Nabert, Schön⁸, IEC 60079-12³ and IEC 60079-20⁴)

Ex group	Temperature class					
	T1	T2	T3	T4	T5	T6
	Ignition temperature					
	> 450° C	450-300° C	300-200° C	200-135° C	135-100° C	100-85° C
Maximum permissible surface temperature of operating facilities						
	450° C	300° C	200° C	135° C	100° C	85° C
II A	Acetone Ammonia Aniline Benzol Chlorobenzene 1,2-Dichlorobenzene Acetic acid Ethane Ethyl acetate (Ethyl bromide) Ethyl chloride (Carbon monoxide) o-Cresol Methane Methyl acetate Methyl alcohol*1 Methyl bromide Methyl chloride Methylene chloride Naphthalene (nitrobenzene) Phenol Propane Toluene o-Xylene	(Ethyl alcohol) (Ethylene glycol) i-Amyl acetate n-Butane n-Butyl alcohol 1-Butylene 1,2-Dichloroethane Di-i-Propyl ether Natural gas Acetic anhydride n-Propyl acetate (n-Propyl alcohol) i-Propyl alcohol Vinyl chloride	n-Amyl alcohol Benzene (petrol) Diesel Fuel oil n-Hexane jet fuels	Acetaldehyde		
II B	Hydrocyanic acid (Ethyl bromide) (carbon monoxide) (Nitrobenzene) Town gas	Butadiene-1,3 Dioxane-1,4 Divinyl ether (Ethyl alcohol) Ethylene (ethylene glycol) **Ethylene oxide Isoprene (n-Propyl alcohol)	Dimethylether **Hydrogen sulphide	Ethyl ether Ether Anaesthetic ether Diethyl ether		
II C	**Hydrogen	**Acetylene				**Carbon disulphide

(): The measured values for the substances placed in brackets are close to the limit or the next group or class when classified in the explosion groups or temperature classes. For this reason, they have been included in both.

** : Extremely flammable substances

*1 (Methanol = Methyl alcohol)



DECISION CRITERIA FOR SELECTING THE CORRECT JDN HOISTS IN EXPLOSION-HAZARDOUS AREAS

Explosion groups of gases and vapours <small>(cf. Explosion groups and temperature classes of the most important gases and vapours)</small>	Zone	Version *1 <small>Manufacturer's responsibility</small>			Operation *2 <small>Operator's responsibility</small>		
		II A	2	A	<i>mini</i> *3		E
	1	A			E		
II B (X) except hydrogen sulphide, ethylene oxide <small>(particularly flammable)</small>	2	A			E		
	1	A	FS		E		
II B	2	A	FS		D	E	
	1	A	FS		D	E	
II C / T4	2	A	FS		D	E	
	1	A	FS	FSR	D	E	
II C / T6(X)	2	A	FS		D	E	T
	1	A	FS	FSR	D	E	T
Explosion-hazardous dusts	Zone	Version *1			Operation *2		
Usual industrial dusts	22	A	<i>mini</i> *3		E		
	21	A			E		
Light-metal or impact-sensitive dusts	22	A	FS		D	E	
	21	A	FS		D	E	

***1: Version features (under the responsibility of the manufacturer):**

A: The chain is made of zinc-plated steel; metal controls are conductively connected to the hoist. This is part of the standard equipment. For technological reasons, a zinc-plated version of chain size 31.5 x 90 is not available. This is only used for the extremely slow-running chain drives of large hoists, so that the sliding velocity for potential friction points between the chain and the surroundings remains well below 1 m/s.

SP: Hoists "with increased spark protection":
Copper-plated load hook and bottom block with brass safety catch.

FSR: Running gear "with increased spark protection":
Running wheels for trolleys and cranes are made of bronze.

***2: Instructions for safe operation (operator's responsibility):**

D : Ignition hazards are not to be expected if hoists or cranes are used in the normal manner. Friction and impacts in the working area of the chain, not resulting from intended use of the hoist or crane and which result in sparking, must be excluded, or an absence of gas in the operating area must be ensured. This means, for example, that the chain, the bottom block and the load hook must be prevented from swinging against surrounding objects or that a gas-free environment must be ensured.

E : Friction, impact and sliding points involving combinations of light metal and steel or cast iron must not be present in the hoist's operating area.

T : Ambient temperature and the type of operation must be examined separately.

***3: Use of MINI type hoist:**

Hoists of the mini type are not available with "increased spark protection" (FS).



**TEMPERATURE LIMIT FOR
EXPLOSION-HAZARDOUS DUSTS**

In areas which are explosion-hazardous due to combustible dusts, the surface temperature must not exceed two-thirds of the ignition temperature in °C of the dust/air mixture. The temperatures of surfaces on which hazardous deposits of combustible dusts can be formed, must not exceed the glow temperature of the relevant dust minus 75°K. Greater safety margins are required if the thickness of the dust layer exceeds 5 mm.

The corresponding surface temperatures can be derived from the lowest values for glow and ignition temperatures of dusts specified in the HVBG/BIA Report 12/97¹⁰ "Combustion and explosion characteristics of dusts":

Synthetic rubber, soot-containing:

Glow temperature 220° C - 75° C = 145° C max. permissible surface temperature

Stearic acid:

Ignition temperature 190° C x 2/3 = 126° C max. permissible surface temperature.

**PLEASE ALSO OBSERVE YOUR
CORRESPONDING NATIONAL
REGULATIONS.**

- ¹ Guideline 94/9/EC OF the European Parliament and the Council of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres
- ² DIN EN 1127-1: Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology, 1997-10
- ³ IEC 60079-12: Electrical apparatus for explosive gas atmospheres, Part 12: Classification of mixtures of gases and vapours with air according to their maximum experimental safe gaps and minimum igniting currents, 1978.
- ⁴ IEC 60079-20: Electrical apparatus for explosive gas atmospheres, Part 20: Data for flammable gases and vapours relating to the use of electric apparatus, 1996-10.
- ⁵ EN 13463-1: Non-electrical devices intended for use in explosive areas - part 1: Basic methodology and requirements, 07/2009
- ⁶ DIN VDE 0165: Installation of electrical systems in areas with explosion hazard, 1991
- ⁷ Redeker, Schön: 6. Supplement to safety-related characteristic values for flammable gases and vapours, 1990
- ⁸ Nabert, Schön: Safety-related characteristic values for flammable gases and vapours, 2nd edition, 1978
- ⁹ DIN EN 50014 (VDE 0170/0171 part 1): 2000-02
Electrical apparatus for use in explosion hazardous areas: General provisions
- ¹⁰ HVBG/BIA report 12/97: Central association of German employer's liability associations/trade association institute for industrial safety



INTENDED USE

JDN Air Hoists are designed for lifting and lowering loads within the specified load-carrying capacities, with a vertically-arranged chain. They are also suitable for pulling loads horizontally. In combination with trolleys, JDN Air Hoists are also suitable for the floorless horizontal movement of loads.

Any other use or use outside these stipulations is deemed to be impermissible. J.D. NEUHAUS GMBH & CO. KG cannot be held liable for any resultant damage. The entire risk is borne by the user (see also **Rules for safe operation of hoists**, page 23).

EMISSIONS

The noise emission data can be found in the **Technical data** table, pages 43.

The noise pressure level of the measurement area at a distance of 1 m from the machine surface was measured in accordance with DIN 45 635, Part 20, at the operating air pressure specified by us. In the hall, the noise pressure level drops by approx. 3 dB (A) every time the distance is doubled.

If the device is operated with additional motor oil lubrication, small amounts of lubrication oil will be released into the environment with the outlet air.

OPERATING CONDITIONS

JDN Air Hoists are extremely robust and require little maintenance. They are suitable for use in explosion-hazardous areas, as well as in areas with increased concentrations of soot and dust, high humidity and at ambient temperatures of -20° C up to approx. +50° C if they are not heated above this level due to external influences. The thermal endurance of chains and hooks is +150° C.



CAUTION!

When touching metallic hand controls which are colder than 0° C, the skin could freeze within a few seconds, and at temperatures above 43° C, burns may occur. As a protective measure, please wear suitable gloves.

For stationary outdoor operation, hoists must be protected against weathering and the maintenance intervals must be shortened.

Depending upon the version, JDN Air Hoists must be operated at a system pressure of 4 bar or 6 bar (see information on the nameplate). If the system pressure is too low, important functions of the hoist will be impaired:

- ▶ The brake will drag and is thus subject to a high degree of wear. An impermissibly high degree of warming could take place.
- ▶ The controls become noticeably less sensitive.



DANGER!

Warning against excessive system pressures

Operating with excessive system pressures results in danger due to overloading. Therefore, the pressure must be limited to that specified on the nameplate.

JDN Air Hoists must be operated with a sufficiently clean and dry air supply. The air supply must fulfil the following quality requirements:

- ▶ Particle size less than 40 µm
- ▶ Particle density less than 10 mg/m³
(corresponds to Class 7 in accordance with ISO 8573-1:2001)



In order to provide adequate compressed air quality, operation with a service unit is recommended. Usually, an oiler is not required in the service unit, as the motor is provided with internal permanent lubrication.

- ▶ Pressure dew point at least 10° C below the lowest expected ambient temperature

Do not operate JDN Air Hoists with other gases.

With moist air and ambient temperatures at or below 0° C, there is a danger of icing in the motor.

Icing can be prevented by:

- ▶ the use of an upstream air dryer or using a service unit with oiler,
- ▶ adding anti-icing agent to the lubrication oil (depending upon moisture content of compressed air)
- ▶ or using compressed air oil (Art. no. 11900) with anti-icing agent for relevant temperatures.

In the event that your JDN Air Hoist is operated in combination with a trolley, please also read the trolley operation manual and the relevant accident prevention regulations for operation with trolleys.



ENERGY REQUIREMENTS

For air pressure, air quantity and connections, see the **Technical data** table in the hoist operation manual concerned.

AIR PRESSURE CONDITIONS IN OPERATION

The system pressure in the air line must correspond to the nominal pressure. Higher pressures must be reduced.

After switching on, the nominal pressure p_1 drops to the actual pressure p_2 .

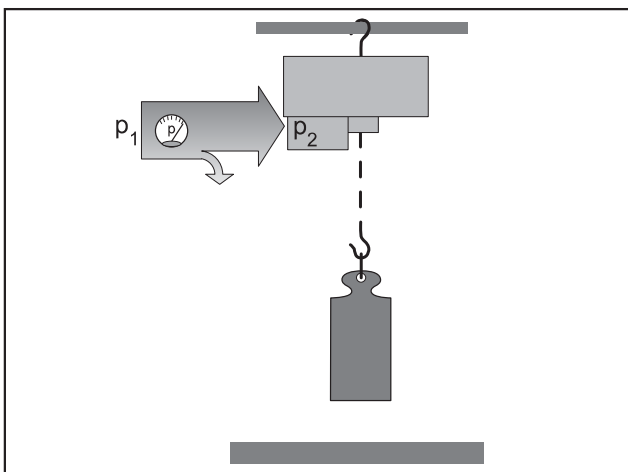
The value of the actual pressure p_2 at which the hoist is operated, depends upon

- ▶ the weight of the load and
- ▶ the direction of movement of the load.

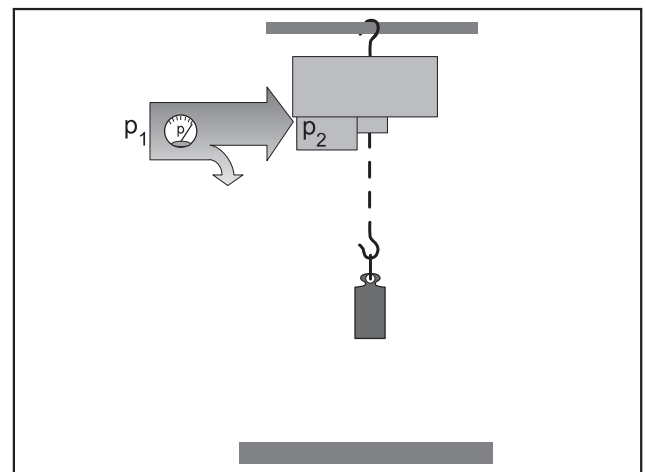
When lifting the nominal load (load-carrying capacity), the actual pressure p_2 must not fall below a value of 10% below the specified nominal pressure of the hoist.

Example:

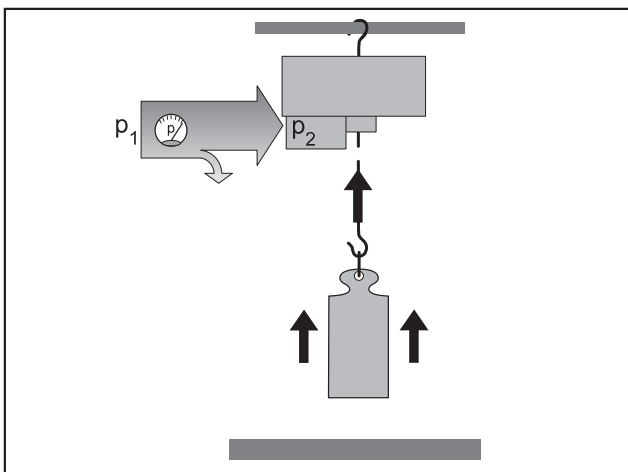
A hoist with a nominal pressure of 6 bar lifts its nominal load at the specified lifting speed, at an actual pressure of 5.4 bar.



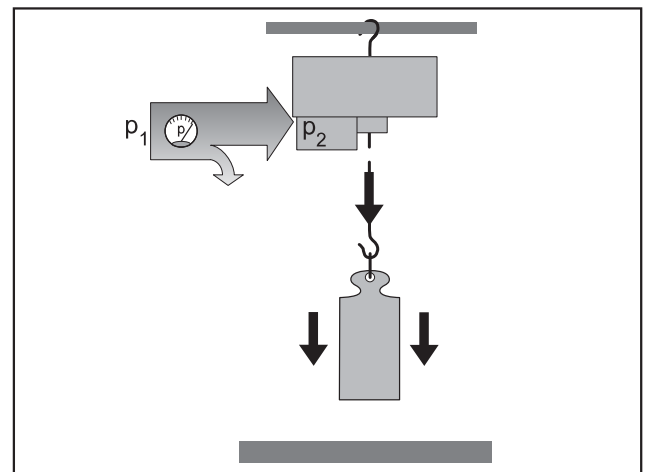
The value of the actual pressure depends upon ...



... the weight of the load ...



... and the direction of movement of the load.



**PRINCIPLE OF OPERATION
OF JDN AIR VANE MOTORS**

The vane motor consists of a cylinder liner **1** with two side bearing plates and an internal rotor **2**.

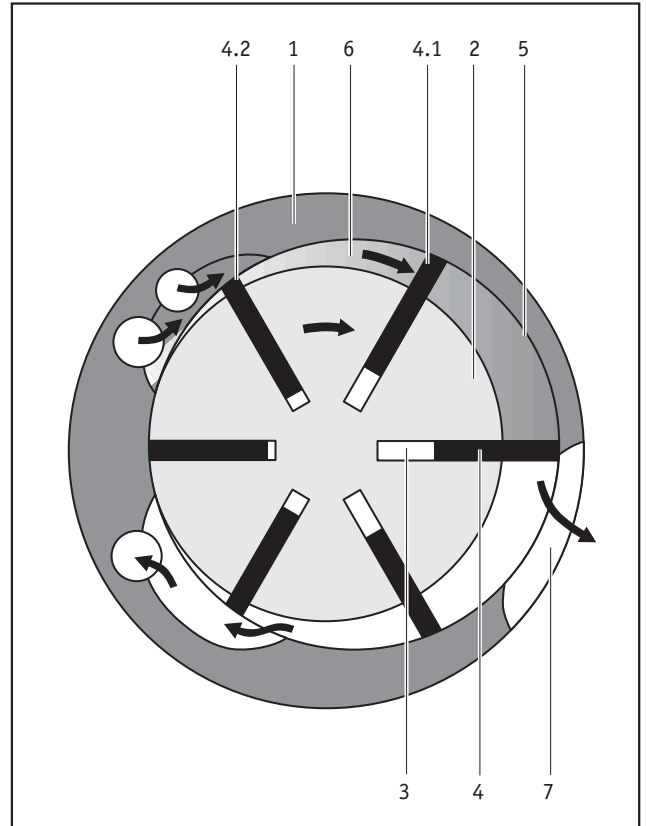
The rotor is mounted eccentrically in the cylinder liner and is provided with slots **3** for installation of the vanes **4**.

The vanes can move freely and make contact with the inner wall **5** of the cylinder liner. Each chamber **6** is formed by two vanes.

Due to the incoming compressed air, a greater force is created at the leading, larger vane surface **4.1** than that at the trailing, smaller vane surface **4.2**. The difference in force generates the rotor torque.

As the chamber passes the outlet aperture **7**, the compressed air can escape.

The arrows in the illustration indicate the direction of rotation of the rotor and the corresponding path of the compressed air.



OPERATION WITHOUT CHAIN BOX



DANGER!

If JDN Air Hoists are operated without a chain box it must be ensured that the idle chain (unloaded chain end) running up or down at the chain sprocket, does not present a hazard, e.g. due to catching, impacting or falling.

Danger due to falling chain can also arise, if the idle chain is first deposited on a load with a large surface and then slides off and drops.

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.

MOTOR LUBRICATION/ OPERATION WITH SERVICE UNIT

JDN air hoists are provided with motor lubrication, which must be renewed when required, but every 5 years at the latest.

Therefore, the service unit for filtration and pressure regulation of the compressed air can be installed without an oiler. If required, the service unit is also available with an oiler. Synthetic lubricants must not be used when operating with a service unit. Alcohols are not permitted for use as anti-icing agents.

CE MARKING/DECLARATION OF INCORPORATION

Only hoists for which EC conformity in accordance with EC Machinery Directive 2006/42/EC has been declared may be operated within the EU.

In the case of a **CE** designation, only the EC conformity declaration provides information on which EC directive has been met.



TRANSPORT AND STORAGE

SAFE TRANSPORTATION

If you wish to transport your JDN Air Hoist to another site, please observe the following points:

- ▶ Carefully dismount trolley (if fitted).
- ▶ Set the entire hoist down carefully; do not allow it to drop. For weights see **Technical data**, page 43.
- ▶ Lay control and supply hoses together in such a way that they are not kinked.
- ▶ Please ensure that the controls are not damaged. Could lead to malfunctions.
- ▶ Draw in the hoist's chain in such a way that loops cannot form and the chain cannot become twisted.
- ▶ Secure the chain.

STORAGE CONDITIONS

BREAKS IN OPERATION

- ▶ In the case of longer operational breaks, coat the chain and hook with a light oil film.
- ▶ Motor conservation
If the motor lubrication is not renewed at the specified intervals, a protective coating must be applied to the motor. For this purpose, use a non-resinous and non-sticky conserving oil with conserving protection duration, which corresponds to the length of the planned operational break.

STORAGE

- ▶ Close off the air supply hose connection using adhesive tape or a suitable cap, in order to prevent dirt ingress.
- ▶ Protect connection for the air supply hose from being damaged.
- ▶ Store your JDN Air Hoist in a clean and dry place.



INITIAL OPERATION

UNPACKING



CAUTION!

When unpacking, take account of the weight of the hoist. See **Technical data**, page 43.



ATTENTION!

Do not kink the control lines. Kinked control lines can result in malfunctions.

- ▶ Keep the accompanying documents in the place provided, near the operating site.
- ▶ Lift the hoist carefully out of the packaging.
- ▶ Dispose of packaging in the local recycling system.

ASSEMBLY

JDN Air Hoists are usually delivered pre-assembled.

If not, first read the following sections:

- ▶ **Connecting the controls**, page 20
- ▶ **Drawing in the chain**, page 40
- ▶ **Chain box**, page 41

In the event that the chain is included unattached, a short auxiliary chain is drawn into the hoist. In order to draw in the chain, the hoist must be connected to the main air supply and must be ready for operation.

PRIOR TO INITIAL OPERATION, THE CHAIN MUST BE LUBRICATED (SEE SECTION LUBRICATING THE CHAIN PAGE 34).

INSTALLING THE HOIST



DANGER!

JDN Air Hoists must only be installed by qualified persons. A defective installation can result in the most serious of accidents.



DANGER!

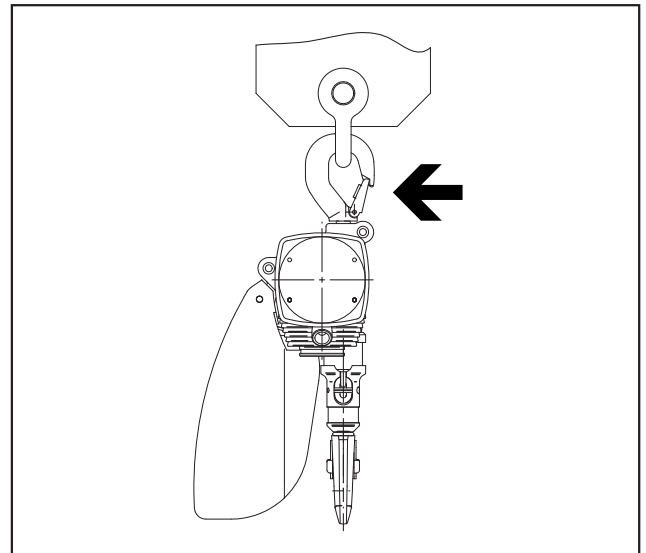
The attachment points for JDN Air Hoists must be able to safely withstand the expected forces.



DANGER!

The supporting structure of the air hoist must form a rigid mounting. Vibration damages the chain and can lead to chain fracture. Furthermore, external vibration must on no account be transmitted to the hoist (lifting gear). (e.g. from the suspended load).

- ▶ Provide a suitable working platform.
- ▶ Attach the hoist at the suspension hook (or suspension eye) to running gear or stationary fixing.
- ▶ Ensure that the hook safety catch closes automatically.



Attach the hoist securely at the suspension hook or suspension eye.



DANGER!

When loads are taken up suddenly on slack chain, especially using hoists with high lifting speeds, forces are generated which may be equivalent to several times the load weight.

Type	Force
mini 125	3-times load-carrying capacity
mini 250	1,9-times load-carrying capacity
mini 500	1,6-times load-carrying capacity
mini 1000	1,4-times load-carrying capacity



CONNECTING THE CONTROLS

If the controls were delivered at the same time but unattached, connect them as follows (see also illustration **Connecting the controls**):

- ▶ Push the one-ear hose clamp onto the hose ends.
- ▶ Grease hose grommets and connect control hoses to the corresponding hose grommets.
Hose 1 (supply air) to grommet 1
Hose 2 (lift) to grommet 2
Hose 3 (lower) to grommet 3.
- ▶ The one-ear hose clamp must lie in the middle of the hose grommet clamping range. The best clamping characteristics are achieved in this range.
- ▶ Secure the hoses using the one-ear hose clamps and crimping tool.
- ▶ Push up bellows and allow them to snap into the groove provided on the valve housing.



ATTENTION!

To ensure perfect sealing, the „ear” must be fully closed on installation.

Installation example

Position the clamp on the hose with nipple.
Crimp the clamp ear until fully closed.



Permissible aperture after crimping

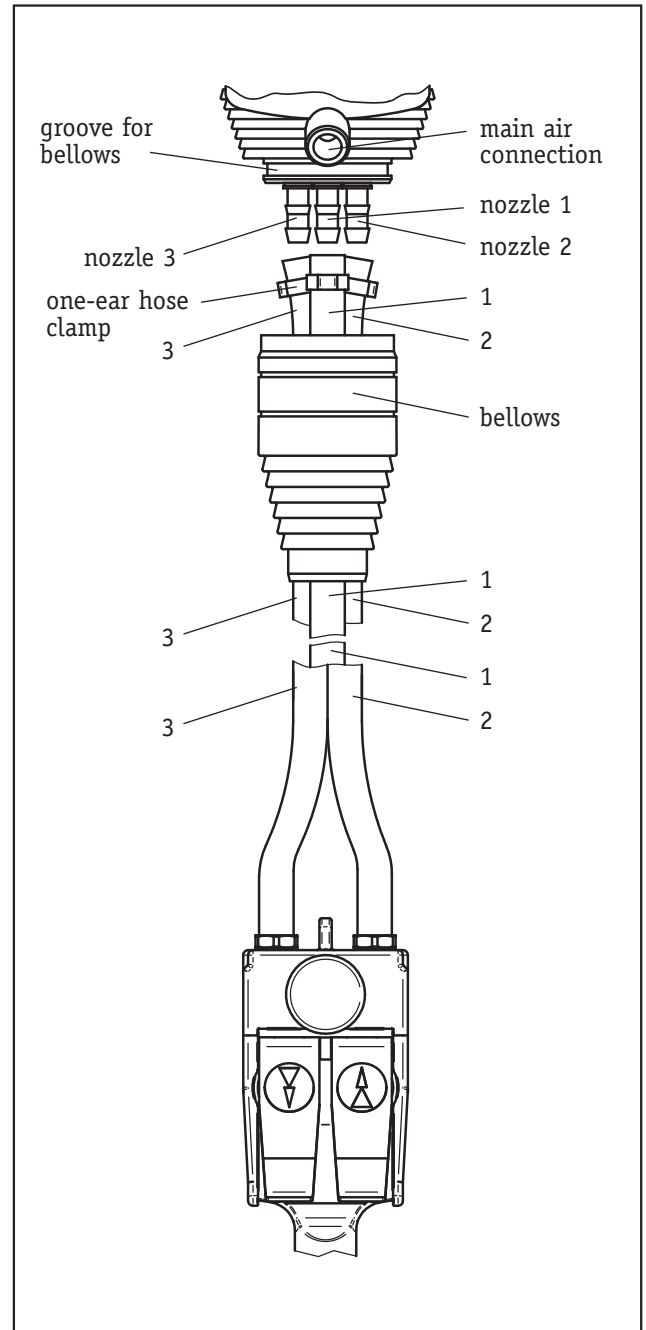
Use of the normal crimping tool...

Pinched one-ear clamp and crimping tool



in order to remove the clamp, set the crimping tool transversely to the clamp ear and cut the ear open....

Removal



Connecting the controls



CONNECTING TO THE MAIN AIR SUPPLY

- ▶ Check air connection for contamination and clean if necessary.
- ▶ Blow through compressed air hose in order to remove foreign bodies.
- ▶ Attach the compressed air hose to the connection on the hoist or on the service unit. Tighten the union nut.

LUBRICANTS

The following lubricants are intended for normal environmental influences.

In the case of wear-promoting environmental influences, please contact J.D. NEUHAUS, to receive the appropriate instructions.



CAUTION!

Oils and greases can cause skin irritation. Wear protective gloves.



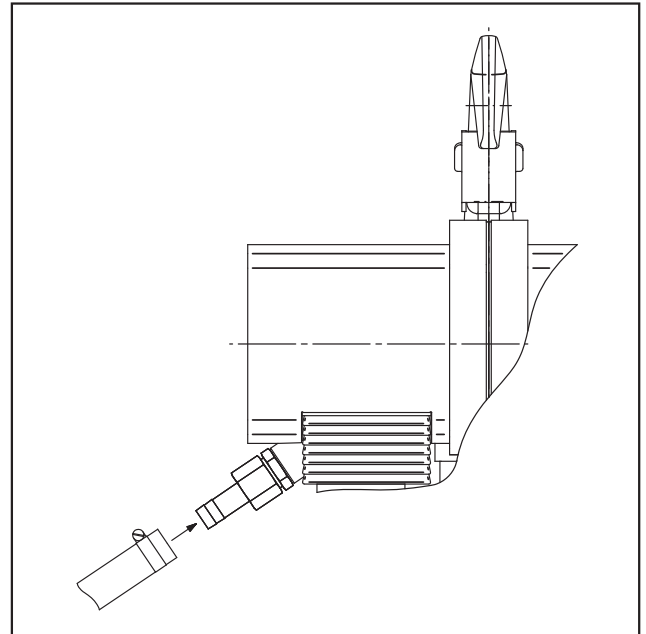
ATTENTION!

Potential damage! Do not mix synthetic oils or greases with mineral oils, as the properties may be impaired.

Also, never mix different types of lubricating grease within the synthetic or mineral lubricant groups.

Synthetic lubricants must not be used when operating with oilers.

Alcohols are not permitted for use as anti-icing agents.



Attach the compressed air hose and tighten the union nut.



Application	Lubricant
Motor lubrication - from factory - when operating with oiler	- JDN high-performance grease, Art. no. 11901 (250 ml) - Compressed air oil "D", kinematic viscosity approx. 30 mm ² /s (cSt) at 40° C, with anti-icing agent where applicable
Chain lubrication	chain oil or motor vehicle engine oil, kinematic viscosity approx. 150 mm ² /s (cSt) at 40° C, or special lubricant from J.D. NEUHAUS In areas with very high corrosion potential, e.g. offshore, a lubricant with extremely strong anti-corrosion properties must be used.
Motor conservation (not applicable when using JDN high-performance grease)	Non resinous Conservation oil with appropriate period of effectiveness
Motor cleaning (not applicable when using JDN high-performance grease)	Pure petroleum
Lubrication of bearings and gearbox (also for exposed gears)	Lithium-thickened grease, worked penetration 265-295 (0.1mm), basic oil viscosity: 190 cSt (mm ² /s) at 40° C, drop point: 180° C, Working temperatures: - 20° C to + 120° C, designation in accordance with DIN 51825: KP2K-20, active agents: EP additives (for wear-reduction) and ageing protection; water resistant and corrosion protection

A copy of the special publication "Recommended lubricants" is available on request.

CHECKING PRIOR TO INITIAL OPERATION

Hoists, including the supporting structure, must be inspected by an appropriately trained and qualified person before initial operation and before re-commissioning after significant modifications. Hoists and lifting gear which are installed in trolleys must be inspected by a specialist.

The inspection covers the proper mounting, equipment level and operational-readiness, in the main, the completeness, suitability and effectiveness of the safety devices as well as the condition of the device, the harness, the equipment and the supporting structure.

Safety devices are braking devices, overload protection devices, EMERGENCY STOP devices, lifting and lowering limiters (emergency end-stop devices).

A description of the inspection can be found in the **Maintenance** section, page 29.



OPERATION

RULES FOR SAFE OPERATION OF HOISTS

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

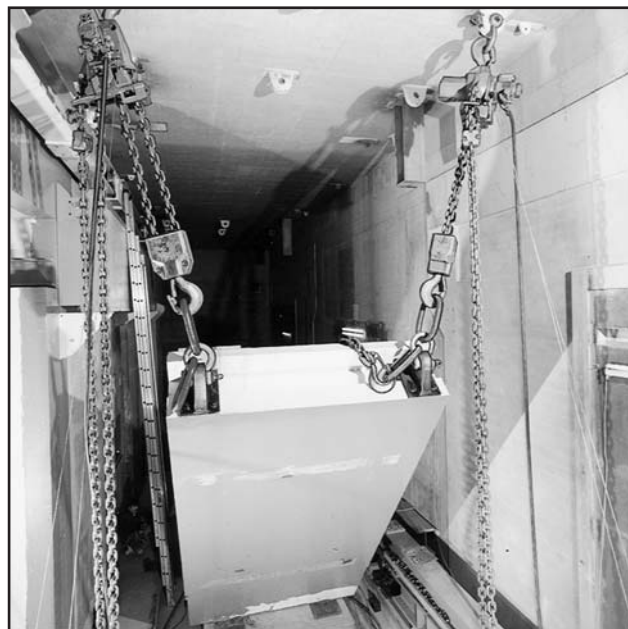
- ▶ Hoists may only be operated by persons charged with this task by their company.
- ▶ Before using the JDN Air Hoist for the first time, familiarise yourself with all permissible operating conditions. For this purpose, read through this operation manual thoroughly and perform the described actions on the hoist, step by step.
- ▶ Report each malfunction to your safety officer immediately, so that the fault can be remedied without delay.
- ▶ Adhere to the regulations of the accident prevention authorities (e.g. Berufsgenossenschaft regulations in Germany).
- ▶ Read the section **Intended use**, page 13.

The following uses are classified as impermissible:

- ▶ Oblique pulling of loads in general.

Definition of oblique pulling

Oblique pulling is the deviation of the load chain and the chain hoist from the vertical position, for a force acting in a straight-line between the point of force application of the load on the load hook and the point of suspension on the supporting structure.



Oblique pulling

Under special safety provisions relevant to the particular situation, JDN Air Hoists may be used for oblique pulling (see **Intended use**, page 13). In this case, a chain box must not be used as the chain may fall out or become knotted.

Oblique pulling is not permitted for hoists installed in trolleys or in running gear. Please contact us, if required.

- ▶ Detaching or dragging of loads.
- ▶ Loading of the hook at the tip.
- ▶ Catching of falling loads.
- ▶ Carrying persons (see **Intended use**, page 13).
- ▶ Jog control with load on the hook.
- ▶ Switching to the opposite direction with load in motion.
- ▶ Operational reaching of lifting and lowering limiters.
- ▶ Never hold the chain in the area of the centre section under tension at the upper or lower limit position of the load hook.



JDN Air Hoists must not be used for the following applications, for example:

- ▶ Critical areas of nuclear plants.
- ▶ Over acid baths or other plants with corrosive substances.
- ▶ In areas in which organic acids are present.

To ensure the safety of personnel and property when using JDN Air Hoists, it is essential that the following points are observed:

- ▶ Lift the load carefully at the beginning.
- ▶ Never touch a running chain.
- ▶ Never use the hoist chain for attaching loads.
- ▶ Never allow loads to fall into the hoist chain.
- ▶ If the chain is slack, do not take up the load at maximum speed.
- ▶ When operating without a chain box, avoid hazards due to idle chain (falling, catching, impacting), see section **Operation without chain box**, page 17.
- ▶ Never apply bending loads to chains.
- ▶ Do not join or repair hoist chains.
- ▶ Do not operate with a chain which is drawn tight, bent or extended.
- ▶ Check blocked chains for damage.
- ▶ Straighten twisted chains (defective bottom block)
- ▶ Do not operate with damaged or worn or rusty chains.
- ▶ Permissible operating temperature for chain and hook:
 - 20° C to + 150° C, permissible ambient temperature:
 - 20° C to +50° C, permissible heat absorption of the hoist body: max. 90° C.
- ▶ Never allow persons to enter the area below the suspended load.
- ▶ Never attempt to remedy a fault with a load suspended from the hoist.
- ▶ Only use suitable and approved attaching aids; do not jam the hook at the point of attachment.
- ▶ Please ensure that the operator is not put at risk within the operating area by attaching aids or the load.
- ▶ Follow the relevant instructions for attaching loads.
- ▶ Before attaching, accurately position the load vertically below the hoist. The chain must hang vertically before lifting.
- ▶ Ensure that the hook safety catch is closed.
- ▶ Before lifting loads, ensure that the maximum permissible load is not exceeded. Attaching aids must be included in the weight of the load.
- ▶ When taking up and setting down, ensure stable positioning of the load, to prevent accidents due to tilting or falling loads.
- ▶ Never drive against jammed loads.
- ▶ Only use **original JDN chain boxes**.
- ▶ Only lift one load at a time; never several loads simultaneously.
- ▶ Never lock the control elements of control devices.
- ▶ In the case of stiff actuating elements, have the hoist repaired.
- ▶ In the case of power failure, secure the load and the surrounding area, until the power is restored.
- ▶ Never use or repair bent, open or deformed load hooks. The hoist must be repaired and the hook must be replaced.
- ▶ Never anneal the hook.
- ▶ Only operate JDN Air Hoists with **original JDN controls**.
- ▶ Uncontrolled, external force factors (such as due to hydro cylinders, falling loads) are not permitted.
- ▶ Repair damaged hook safety catches.
- ▶ Repair stiff hook bearings.
- ▶ Do not kink or pinch control hoses.
- ▶ Have loosened bolted connections tightened by the Repairs department.
- ▶ Before removing compressed air hoses, shut off the main air supply.
- ▶ Do not exceed the permissible capacity of the chain box.
- ▶ Repair the hoist if the braking distance is excessive.
- ▶ If a load is lifted using several air hoists, prevent overloading due to incorrect weight distribution.
- ▶ Select a safe operating location.
- ▶ Ensure the correct system pressure.
- ▶ Never touch metallic hand controls which are colder than 0° C or hotter than 43° C, without suitable protective gloves.
- ▶ Do not make modifications to the hoist.
- ▶ 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.
- ▶ Do not switch on multi-chain hoists if the bottom block is supported.
- ▶ Special safety precautions must be taken when lifting loads into areas which are out of sight.



**DANGER!**

For all air hoist applications, ensure that the load hook can be lowered all the way to the ground, in order to prevent a load being moved to the lower limit position, without reaching the ground. Danger due to overloading.

**DANGER!**

Never use hoists on the ground if they are not specifically intended for horizontal pulling.

**DANGER!**

The fatigue strength of chains is significantly impaired due to extreme corrosion (pitting corrosion). There is a **danger of fracture**. Hydrogen-induced embrittlement with resultant stress cracks due to highly corrosive media (e.g. seawater) may affect high-strength steels (e.g. chains). Danger of fracture! This process is promoted by so-called recombination poisons. Examples of these are hydrogen sulphide, cyanide, arsenic compounds and rhodanide.

If rusty chains are not replaced for operational reasons, crack inspections are to be performed at intervals of three months.

Company operating instructions

In the case of particularly difficult lifting equipment applications, the company must provide comprehensible operating instructions in the language of the operator, within the framework of this operation manual. Here, measures for safe operation are stipulated in accordance with prevailing operating conditions.

Furthermore, it is essential that all the regulations set out in sections **Intended use**, page 13 and **Operating conditions**, page 13, are observed.



CONTROLS

All MINI series JDN Air Hoists are equipped with direct controls. The air is supplied directly to the motor via the hand valve.

The pushbuttons return to the zero position automatically when released.

The directions of movement of the load hook are marked by arrows on the buttons of the controls.

Lifting and lowering speeds can be regulated precisely.

- ▶ Lifting slowly: press right pushbutton slowly until the motor starts up.
- ▶ Lifting more quickly: press right pushbutton in further.
- ▶ Gradual change from fast to slow lifting: allow operated pushbutton to return slowly.
- ▶ Lowering slowly: press left pushbutton slowly until the motor starts up.
- ▶ Lowering more quickly: press left pushbutton in further.
- ▶ Gradual change from fast to slow lowering: allow operated pushbutton to return slowly.

EMERGENCY STOP DEVICE

Each control is equipped with an EMERGENCY STOP device.

In order to avert danger arising from the lifting movement as quickly as possible, the pushbuttons must be released; the movement of the load is interrupted immediately.

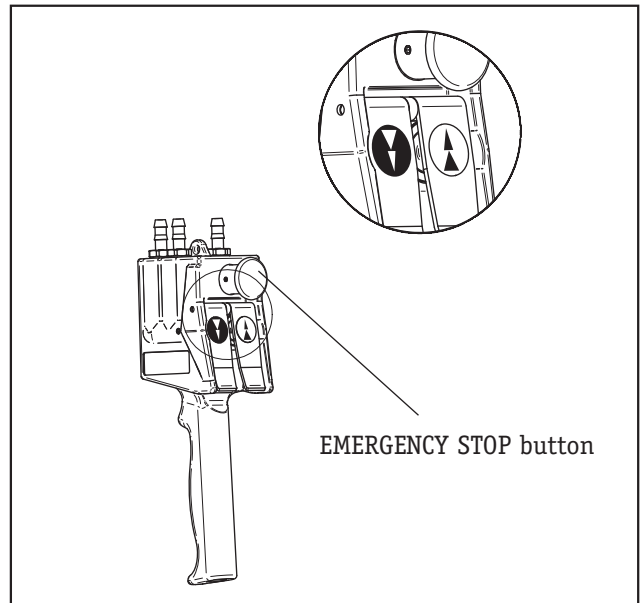
Only in the case of failure of this stop function, must the red EMERGENCY STOP button be firmly pressed. The EMERGENCY STOP button engages. This results in the closing of a separate check valve and the load hook comes to rest instantaneously. The pushbuttons for lifting and lowering now no longer function.

The EMERGENCY STOP button can be released again by pulling.



DANGER!

Never release the EMERGENCY STOP button before the danger has been eliminated and the stop function via the pushbuttons has been restored.



Control with EMERGENCY STOP device



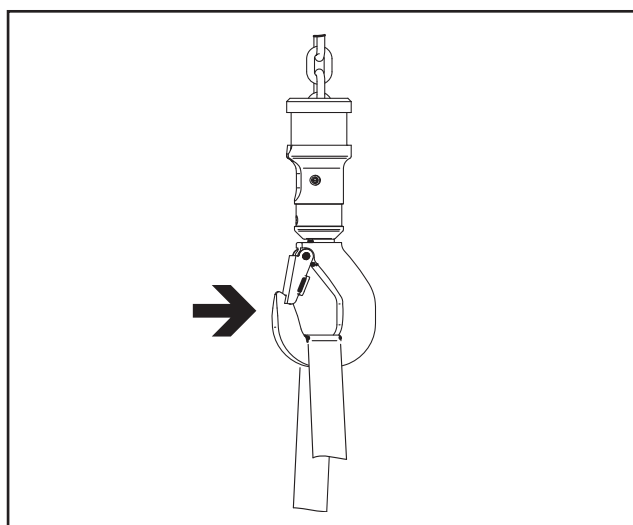
ATTACHING THE LOAD**DANGER!**

Only use attaching cables or attaching chains which are suitable for the load. Attaching must not be attempted by winding with the lifting chain around the load.

In Germany, the trade association regulations "Operation of Load-carrying Devices Used with Lifting Equipment" must be observed (BVR 259).

In other countries, the relevant national regulations are applicable.

- ▶ Attaching aids must be attached at the lowest point of the hook. Never load the point of the hook.
- ▶ Ensure that the hook safety catch is closed.



Attach the load safely

LIFTING THE LOAD**ATTENTION!**

JDN Air Hoists must be capable of alignment under load. Otherwise impermissible additional forces can occur, which can damage the hoist components.

- ▶ First, lift the load hook, in order to pull the slack chain tight. With the chain tight, briefly interrupt the lifting procedure. The hoist can align itself and the material is protected.
- ▶ Then lift the load.

LOWERING THE LOAD**DANGER!**

Ensure that there are no persons below the load.

- ▶ Then lower the load and ground it carefully.

**DANGER!**

For all air hoist applications, ensure that the load hook can be lowered all the way to the ground in order to prevent a load being moved to the lower limit position, without reaching the ground. Danger due to overloading.

DETACHING THE LOAD

- ▶ Lower the load hook far enough, so that the load can be easily detached.
- ▶ Move the load hook out of the lifting area, in order to avoid hazardous situations.

INTERRUPTING WORKING

If you wish to interrupt working with your JDN Air Hoist:

- ▶ Set down and detach the load.
- ▶ Move the load hook out of the lifting area, in order to avoid hazardous situations.



TAKING OUT OF OPERATION

SHUTTING DOWN

If the hoist is to be taken out of operation for a longer period of time it must be protected against corrosion and dirt.

- ▶ Coat the chain and hook with a light oil film.
- ▶ Move the load hook out of the lifting area, in order to avoid hazardous situations.
- ▶ Do not move against the lifting and lowering limiters/buffers (emergency end stop devices).
- ▶ Depressurise the air line.

STORAGE

(see section **Storage conditions**, page 18)

DISMANTLING



DANGER OF INJURY!

JDN Air Hoists must only be dismantled by qualified personnel.

- ▶ Depressurise the air line.
- ▶ Provide a suitable working platform.
- ▶ Loosen the union nut and remove the air hose.
- ▶ Protect the air connection against the dirt ingress.
- ▶ Detach the control hoses from the hoist.
Do not kink the control hoses.
- ▶ Mark the connections.
- ▶ Detach the strain-relief and hose carrier and remove the control device.
- ▶ Carefully detach/dismount the hoist and remove.
- ▶ For trolleys, proceed in reverse order to that described in the section on mounting trolleys (in the trolley operation manual).

DISPOSAL

JDN Hoists contain 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:

HOIST

- ▶ Ferrous materials
 - Steel
 - Cast steel
- ▶ Non-ferrous metals
 - Aluminium
- ▶ Plastics
 - Polyethylene
 - Polypropylene (PP)
 - Polyurethane
 - Polyvinyl chloride (PVC)
 - Polyamide
 - Natural rubber
 - Polyacetal
 - Thermoset moulding compound (Asbestos-free brake lining)
 - Polyester
 - Wool felt



MAINTENANCE

MAINTENANCE AND INSPECTION INTERVALS

JDN Air Hoists are extremely robust and require little maintenance. Compliance with maintenance and inspection intervals is of great importance in order that the hoist operates safely and reliably over a period of many years.



CAUTION!

Maintenance work on JDN Air Hoists must only be performed by trained and qualified personnel.

CLEANING AND CARE

If your JDN Air Hoist is often used at different locations, particularly in dirty and damp environments,

- ▶ clean any dirt off the hoist and the chain,
- ▶ seal off the air supply connections,
- ▶ protect the hoist and, in particular, the chain from corrosion,
- ▶ store the hoist in a clean and dry place.

SPARE PARTS

If, during repair work, the replacement of components is necessary, only **original JDN spare parts** may be installed.

LUBRICANTS

(see section **Lubricants**, page 21)

INSPECTION AND REPAIRS

Series lifting equipment is classified into groups and dimensioned according to the type of operation (Driving mechanism classification according to ISO/FEM). The classification (M3/1 Bm) is determined by the average daily operating time (max. 1 hour) and the load spectrum. The theoretical operating time for load spectrum 2 (average) is 1600 hours. This corresponds to 400 full-load hours. This is assuming that the lifting and lowering paths are approximately the same.

For devices used mainly in vertical operation (from 75 % of on-time), the theoretical operating time is reduced due to the higher lowering speed in the range from 50 % to 100 % of the nominal load.

Therefore, the determined portion of the theoretical operating time must be multiplied by a factor of f_v .

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).

$$f_v = 1 + 0.5 \frac{P-50}{50} \quad (\text{for } P > 50\%)$$

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. The inspection log is only supplied in the Federal Republic of Germany. Instructions and a **model for determining the actual operating time** can be found from page 31 onwards.

When the theoretical operating time has been reached, a general overhaul must be performed. Detailed explanations for the determination of the actual operating time and its documentation can be found in the national safety regulations. Alternatively, the calculation model in this operation manual can be used. The general overhaul must be initiated by the operator and must be documented in the inspection log. Information on general overhaul can be requested from the manufacturer.



Only if the group classification corresponds to the actual type of operation of the lifting equipment, does a safe operating period conform to the theoretical operating time. Deviations of the actual type of operation from that used for calculation extend or shorten the safe operating period.

For all inspection work which is not a part of the daily inspection, suitable access must be made to the hoist. The hoist must be disconnected from the main air supply during assembly work.

Dismantling the hoist, see page 28.



CAUTION!

Following each repair, the hoist must be checked for operational readiness.



**INSTRUCTIONS CONCERNING THE
"MODEL FOR DETERMINING THE
ACTUAL OPERATING TIME"**

The decisive factors for the type of operation are the collective loads with different cubic averages k . The collective load indicates to what degree a driving mechanism, or a part of one, is subjected to its maximum stress or only to smaller stresses. The cubic average (factor of the load spectrum) is calculated using the following formula.

$$k = \sqrt[3]{(\beta_1 + \gamma)^3 \cdot t_1 + (\beta_2 + \gamma)^3 \cdot t_2 + \dots + \gamma^3 \cdot t_\Delta}$$

Definitions:

$$\beta = \frac{\text{Maximum or ultimate load}}{\text{Load-bearing capacity}}$$

$$\gamma = \frac{\text{Dead load}}{\text{Load-bearing capacity}}$$

$$k = \frac{\text{Operating time with maximum load or partial load and dead load}}{\text{Total operating time}}$$

$$t_\Delta = \frac{\text{Operating time with dead load}}{\text{Total operating time}}$$

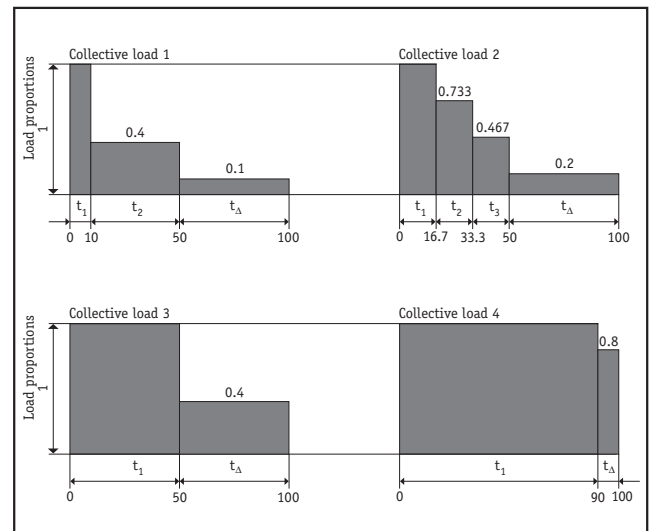
The FEM* 9.511 rule differentiates between four collective loads, which are identified by the definitions and by the ranges of the cubic averages k . This classification complies with ISO 4301/1.

*FEM = Federation Europeene de la Manutention (European Federation of Materials Handling and Storage Equipment)

The formula given for the cubic average k does not take the weight of the harness into account. This is permissible if the ratio

$$\frac{\text{Weight of harness}}{\text{Load-bearing capacity}} \leq 0.05$$

To determine the type of operation for calculating the partial operating times (actual operating time), the following collective load diagrams can also be used.



Collective load		Definition	Cubic average	Collective load factor
1 (low)	L1	Driving mechanisms or parts thereof, which are only subject to the maximum stress in exceptional circumstances, and are only subject to very low stresses continuously.	$k \leq 0.50$	$k_m = k^3 = 0.125$
2 (average)	L2	Driving mechanisms or parts thereof, which are subject to the maximum stress often, and are only subject to low stresses continuously.	$0.50 < k \leq 0.63$	$k_m = k^3 = 0.25$
3 (high)	L3	Driving mechanisms or parts thereof, which are subject to the maximum stress often, and are subject to average stresses continuously.	$0.63 < k \leq 0.80$	$k_m = k^3 = 0.5$
4 (very high)	L4	Driving mechanisms or parts thereof, which are subject to the maximum stress of adjacent stresses regularly.	$0.80 < k \leq 1,00$	$k_m = k^3 = 1$



The specified inspection intervals are valid for use in accordance with the classification (see driving mechanism classification on the nameplate). The service life is approx. 10 years if the device is used in accordance with its classification. If the hoist is used more intensively the intervals are to be shortened accordingly. The intensity of use must be assessed using the **model for determining the actual operating time** (see page 31). All operating hours are translated into full load hours. The theoretical operating time and the interval hours are indicated in full load hours.

Maintenance measure	Interval	Comment
Check oil level in the service unit ¹	As required	see Service unit operation manual
Lubricate chain	Monthly	Shorten inspection intervals in the case of wear-promoting operating conditions (Section Lubricating the chain , page 34)
Visually check the chain	Weekly	

Inspection measure	Interval	Comment
Check control equipment and EMERGENCY STOP device	Daily	(Section Checking controls and emergency stop , page 35)
Check braking function	Daily	(Section Checking braking function , page 34)
Visually check lifting and lowering limiters (buffers)	Daily	Replace buffer immediately if damaged, otherwise replace at least once a year (Section Checking lifting and lowering limiters , page 34)
Check chain	Every 3 months	(Section Checking chain , page 39). Shorten inspection intervals in the case of wear-promoting operating conditions.
Check sprocket wheel and chain guides	Each time the chain is changed	
Check all bolted and pin connections	Yearly	
Check load hook on the load and carrying side	Yearly	(Section Checking and replacing load hook and buffer , page 38)
Checking axial movement of the load hook	Yearly	Max. axial play of the load hook mount: 2.5 mm (Section Checking axial play , page 38)
Check brake with load	Yearly	The load must be braked reliably
Check service unit ¹	Yearly	See Service unit operation manual
Check silencer for permeability	Yearly	(Section Checking silencer for permeability , page 35)
Check compressed air connections for damage	Yearly	
Check motor, clean and grease control valve	Yearly	Measure the lifting speed
Check condition of chain box including mountings	Yearly	Section Chain box , page 41
Renew grease lubrication of motor	As required, At least every 5 years	(Section Installation/motor lubrication , page 37)
Check brake wear and motor vane wear	Every 5 years	(Section Replacing brake disc, brake piston and vanes/motor installation , page 36), replace motor vanes every 5 years
Check gearbox and perform lubricant change	Every 5 years	
Check shaft coupling and lubricate with gear grease	Every 5 years	

¹ If fitted



LUBRICATE THE CHAIN

The chains of JDN Air Hoist must be lubricated in the links, in unloaded condition.

- ▶ Clean heavily contaminated chains.
- ▶ Lay the chain in a suitable container.
- ▶ Spray the chain with special lubricant or motor vehicle engine oil.

If you wish to lubricate the hanging chain, ensure that the chain links are oiled at the points of contact. For this purpose, move the chain to and fro.

A high-performance lubricant in an aerosol can is available from JDN, which adheres well to the chain after the solvent has evaporated and does not drip off, Art. no. 12066 (aerosol 400 ml).

For operation in areas with high corrosion potential, e.g. in the off-shore sector, the chain can be largely protected against corrosion by the use of special lubricants.

These types of lubricants are characterised by weathering resistance, water insolubility, good adhesion properties etc. Re-lubrication intervals must be stipulated in accordance with the loading. Please contact us, if required.

CHECKING BRAKING FUNCTION

Check the function of the brake daily as follows:

- ▶ Switch the unloaded air hoist alternately between lifting and lowering modes.

If a control element is released, the chain must be seen not to run on.



DANGER!
If the chain runs on, do not use the hoist. The hoist must be repaired.

For physical reasons, the braking distance cannot have the value zero. However, for the purpose of this functional check, running on of the chain must not be perceptible.

BRAKING DISTANCE UNDER NOMINAL LOAD (LOAD-CARRYING CAPACITY) AFTER LOWERING HAS BEEN STOPPED

Type	mini 125	mini 250	mini 500	mini 1000
Pushbutton control with 2 m hose length	84	60	36	48

Dimensions in mm

If the control hoses are long the braking distances will increase due to longer air evacuation times.

CHECKING DIRECTION OF MOVEMENT

Check that the direction of movement of the load hook corresponds to the direction indicated by the arrows on the control elements.

CHECKING LIFTING AND LOWERING LIMITERS

- ▶ Inspect buffers for damage daily. If considerable damage is found at the buffer, or if it is completely destroyed, a length of 20 cm must be cut from the chain directly above the load hook to prevent breakages.
- ▶ Replace buffer at annual inspection, inspect buffer discs for damage, replace if necessary.



DANGER!
Hook travel limit buffers are for emergency use only, repetitive impact of buffers is not allowed!



DANGER!
If the buffer is damaged, do not use the hoist. The hoist must be repaired (replace the buffer).



CHECKING CONTROLS AND EMERGENCY STOP

The control elements of the controls must always be easily moving.

- ▶ Unload the JDN Air Hoist.
- ▶ Briefly actuate and release all control elements of the controls one after another. The control elements must return to their initial positions immediately. The switching on and off function must operate correctly.
- ▶ Press the EMERGENCY STOP button.
Each movement of the hoist must stop.
Actuation of the control elements must not cause a lifting or lowering movement.
- ▶ Release the EMERGENCY STOP button by pulling.

The control piston of the control valve at the motor must be free-moving. If the seat at the sealing ring does not close, the air supply escapes directly into the outlet air chamber.

If the ball in the inner seat of the control piston does not close, outlet air escapes at the hand control valve.



DANGER!

If a control element is stiff or remains in the actuated position, do not use the hoist. The controls must be repaired.

CHECK THE SILENCER FOR PERMEABILITY

The silencer must be checked for permeability if the hoist does not achieve the specified lifting speed (see section **Technical data**, page 43).

The test is performed by comparing the lifting speeds under nominal load, with and without the silencer. The speed with silencer must be at least 65% of the lifting speed without a silencer element. In the event of lower values, the silencer elements must be replaced.

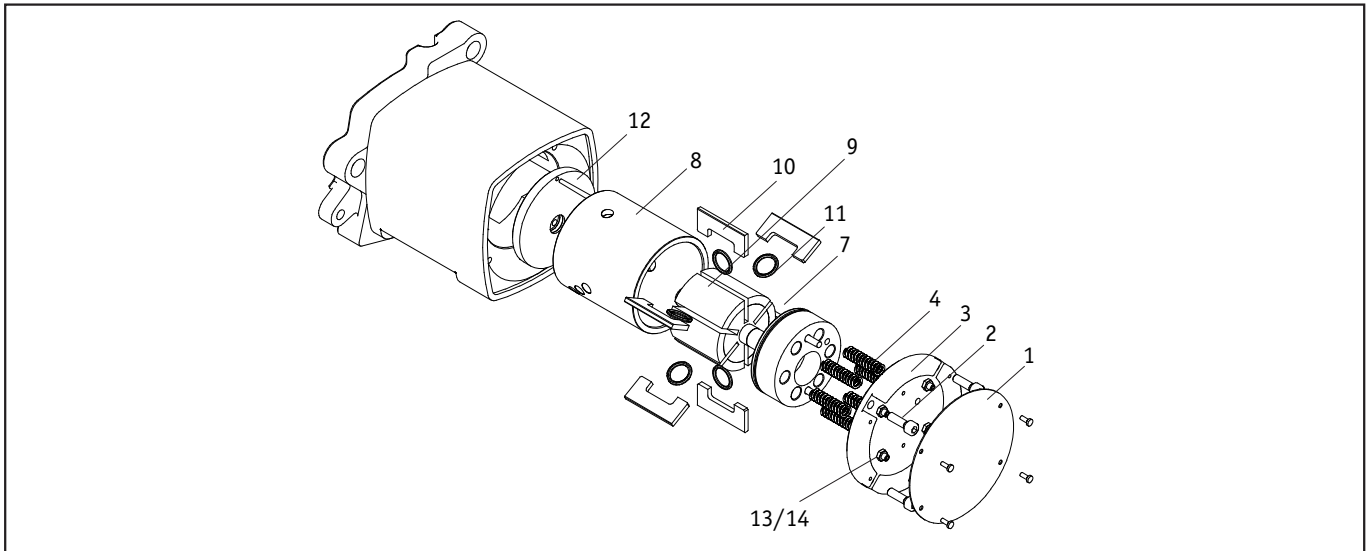


DANGER!

Never employ the hoist in daily use without silencer elements!



REPLACING BRAKE DISC, BRAKE PISTON AND VANES/ MOTOR INSTALLATION



Replacing brake discs, brake piston and vanes/ Motor installation

The braking action is applied at the lateral surfaces of the rotor. The rotor is pressed via spring force from the cover side of the motor against a brake disc located on the opposite side by means of a brake piston.

ADJUSTING THE BRAKE

- ▶ Remove the nameplate **1**.
- ▶ Release the lock nuts **14** of the adjusting bolts **13** (4 screws).
- ▶ Screw in the adjusting bolts **13** to the stop in the cover; do not tighten.
- ▶ Then screw back the adjusting bolts **13** 45° from the stop, hold and lock with the nuts **14**.
- ▶ Attach the nameplate.

REMOVAL

Proceed as follows when removing the brake disc and brake piston:

- ▶ Disconnect the hoist from the main air supply.

- ▶ Unscrew the nameplate **1**.
- ▶ Remove the cover bolts **2** behind the nameplate and detach the cover **3** (when the cover bolts are removed, the tension of the brake springs **4** is fully released).
- ▶ Remove the springs **4**.
- ▶ Remove the brake piston **7** from the cylinder liner **8**.
- ▶ Pull out the rotor **9**, collecting the vanes **10** and starting aids **11**.

NOTE

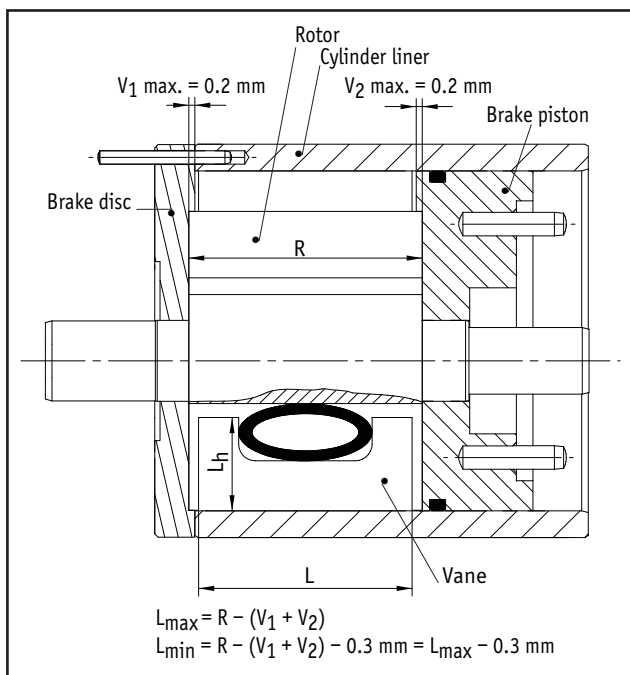
If you only wish to replace the vanes with the starting aids, please continue with the section "Checking for vane wear".

- ▶ Pull out the cylinder liner **8**.
- ▶ Remove the brake disc **12**.
- ▶ Check the brake disc **12** and brake piston **7** for wear and damage, replace if necessary. The circular wear pattern must not be deeper than 0.2 mm. The extremely low-wear braking material will not reach the wear limit of 0.2 mm 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).

- ▶ Checking vane wear (see illustration **Checking vane wear**, page 37). When the air motor vanes are worn, the motor power and consequently the lifting performance of the JDN Air Hoist are reduced. Replacing the vanes together with the starting aids.



Checking vane wear

	L_h
MINI 125 / 250	≥ 14 mm
MINI 500 / 1000	≥ 19 mm

ASSEMBLY / MOTOR LUBRICATION

- ▶ Fit the brake disc, inserting the anti-twist device (pin), lightly coat brake side with high-performance grease (JDN ART. No. 11901).
- ▶ Insert cylinder liner, align on the bore of the anti-twist device with the pin before inserting, lightly coat cylinder liner on the inside with high-performance grease.
- ▶ Lightly coat the vane slots, cylinder and end surfaces of the rotor with high-performance grease and insert rotor into the housing bearing with the clutch side first.

- ▶ Coat the vanes lightly with high-performance grease and push into the rotor slots with the starting aids.
- ▶ Lightly coat the entire brake piston surface including its seal with high-performance grease and push it into the cylinder liner with the braking surface first; note the correct position of the eccentric bore.
- ▶ Lightly coat the outer rotor bearing (needle bush) with high-performance grease as well.
- ▶ Insert the brake springs into the bores of the brake piston.
- ▶ Install the cover with bearing, ensure correct seating of the brake springs and locating pins to the motor housing and to the brake piston, screw back the adjusting bolts **13** beforehand.
- ▶ Do not tighten the four adjusting bolts **13** after bolting the cover in place; only screw them in loosely to the stop in the cover, screw back the lock nuts **14** sufficiently beforehand.
- ▶ Then screw back the adjusting bolts **13** 45° from the stop, hold and lock with the nuts **14**. For operation in areas with ambient temperatures exceeding 30° C, the adjustment must be performed with the hoist warmed up accordingly.
- ▶ Attach the nameplate.



ATTENTION!
Refer to tightening torques table, page 45.

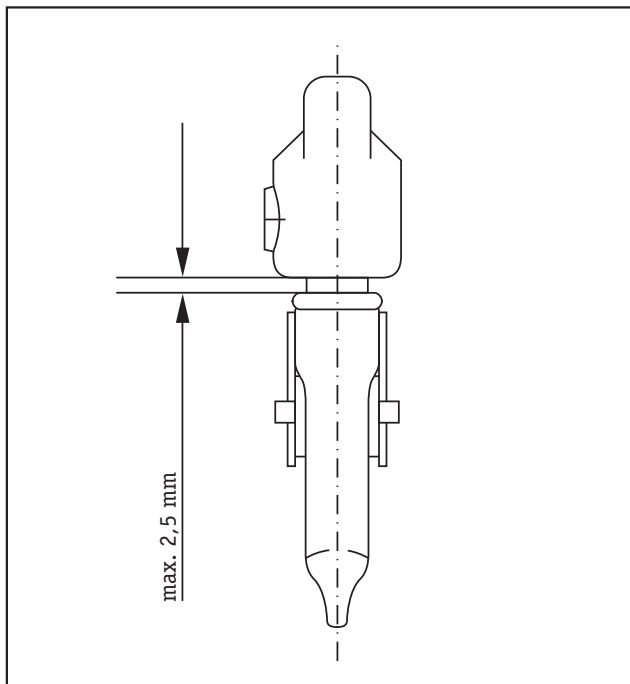


CAUTION!
Check the braking action of the hoist under load (run in the brake by performing several hoisting cycles, then assess) prior to initial operation. Check the motor power. In the event of low motor power, reset the adjusting bolts.



CHECKING AXIAL PLAY

When the axial play of the installed hook or load eye exceeds 2.5 mm (see drawing), the worn parts must be replaced.



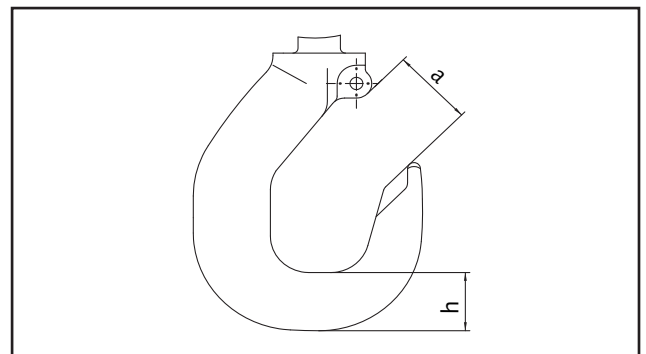
Load sleeve with load hook or load eye

CHECKING AND REPLACING LOAD HOOK AND BUFFER

If the hook opening **a** and the height **h** of the load hook are outside the wear limits, the hook must be replaced.

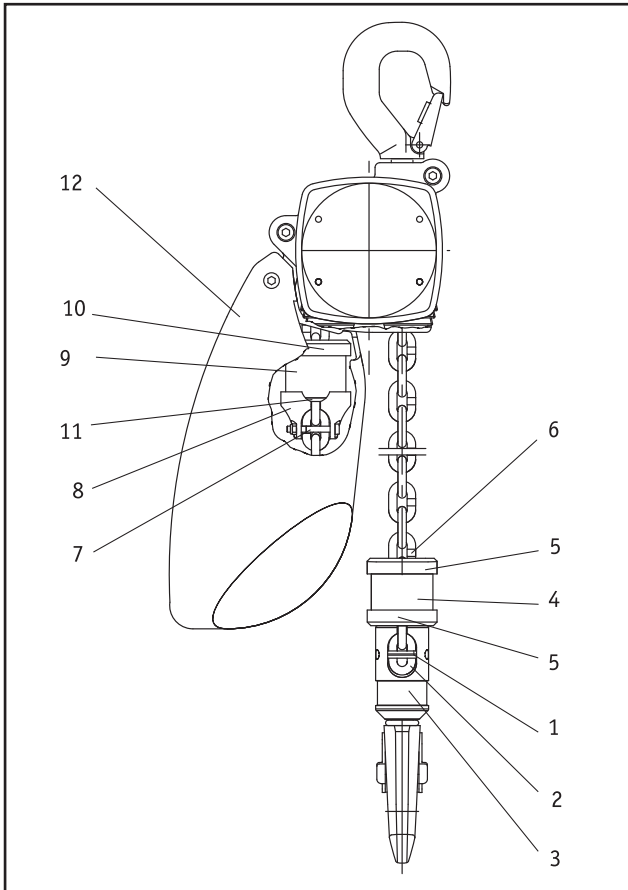
Load-carrying capacity	Maximum permis. dimension of hook opening a ¹⁾	Minimum height h
up to 250 kg	23.5 mm	14.3 mm
500 kg up to 1000 kg	33.6 mm	22.8 mm

¹⁾ If a safety catch is fitted, the sheet-metal thickness of the safety catch must be subtracted from the maximum permissible hook opening dimension **a**.



Check dimensions of the load hook

REPLACING LOAD HOOK INCLUDING LOAD SLEEVE AND BUFFER



Replacing load hook including load sleeve and buffer

REMOVAL

- ▶ Drive out the roll pin **1** for securing the chain link **2** from the load sleeve **3**.
- ▶ Remove the chain link **2** from the chain pocket.
- ▶ Detach the buffer **4** and buffer discs **5** from the chain.

ASSEMBLY

- ▶ Push the buffer disc **5** with edge (edge encloses buffer) and the buffer **4** onto the chain.
- ▶ Insert the chain link **2** into the chain pocket of the load sleeve **3** (ensure the position of the weld **6** is correct).
- ▶ Drive the new roll pin **1** for securing the chain link **2** into the load sleeve **3**.

REPLACING BUFFER ON THE END OF THE CHAIN

REMOVAL

- ▶ When operated with a chain box **12** the chain box must be removed first.
- ▶ In the case of hoists with a chain box, the end chain link is not attached to the hoist body.
- ▶ In the case of hoists without a chain box, remove the end chain link from the chain mount at the hoist body, to do this loosen the screw connection.
- ▶ Loosen screw connection **7** at the clamp **8**.
- ▶ Remove the clamp **8** from the chain.
- ▶ Detach the buffer **9** and buffer discs **10+11** from the chain.

ASSEMBLY

- ▶ Push the buffer disc **10** with edge (edge encloses buffer), the new buffer **9** and the buffer disc **11** without edge onto the chain.
- ▶ For the version with chain box, insert first chain link into the chain pocket of the clamping sleeve **8**, for version without chain box **11**. Insert chain link into the chain pocket of the clamping sleeve **8**.
- ▶ Secure screw connection **7** for securing the chain link at the clamping sleeve **8**.
- ▶ When operated without a chain box, fasten the end chain link to the hoist body.



ATTENTION!

Do not twist the chain.
The chain is subjected to impermissible stresses if the chain is twisted.

- ▶ Attach the chain box, if fitted.



ATTENTION!

In versions with chain box, the end chain link is not attached to the hoist body.

CHECKING CHAIN

If the chain of the JDN Air Hoist displays one of the following features, it must be replaced with a new one:

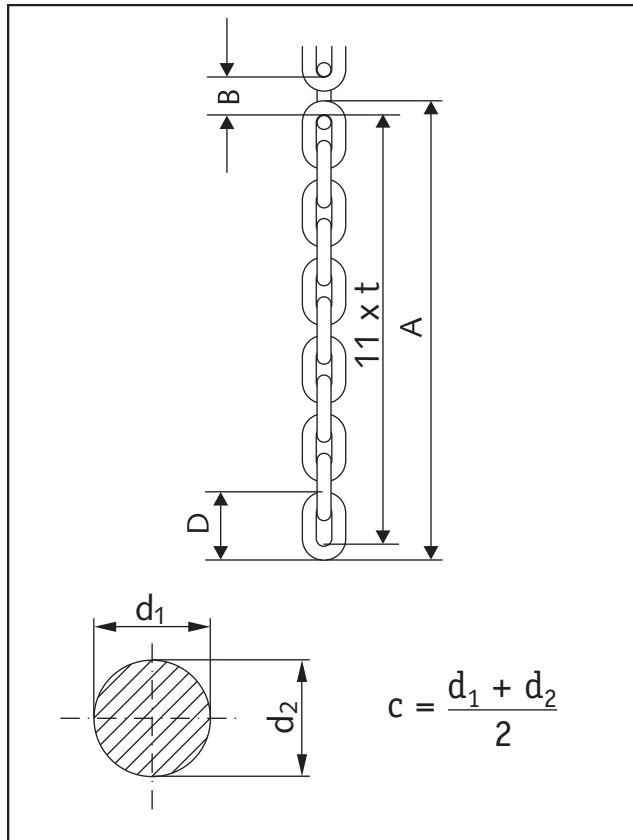


- ▶ Corrosion pitting
- ▶ Bent or damaged chain links
- ▶ Chain drawn tight
- ▶ Wear over 11 pitches (A_{max})
- ▶ Single pitch wear (B_{max})
- ▶ Elongation of a single link (D_{max})

A check gauge can be obtained on request from JDN (Art. No. 12173).

Please observe the information contained in DIN 685, part 5 when checking chains. For further instructions, see ISO 7592.

Chain d x t (mm)	4 x 12	7 x 21
A_{max} 11 x t inside max.	142.9 135.2	249.2 235.8
B_{max}	12.7	22.1
C_{min}	3.6	6.3
D_{max}	20.6	36.1



Check dimensions of chain

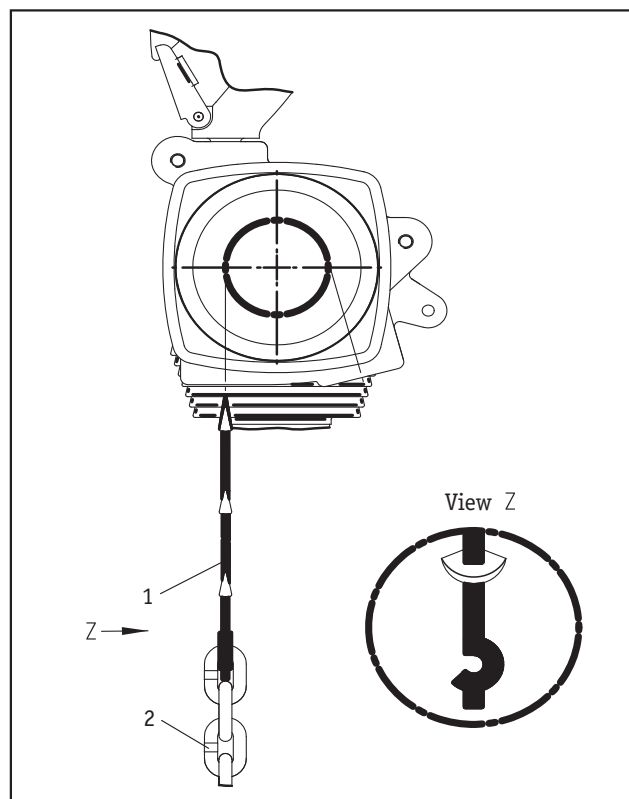
REPLACING CHAIN AND CHAIN SPROCKET

REMOVING CHAIN

The chain sprocket must be replaced together with the chain, as otherwise increased wear of the new chain is to be expected.

- ▶ Detach the chain box from the hoist body.
- ▶ Then detach load sleeve, clamp, buffer and buffer discs from the chain as described in the section **Replacing load hook including load sleeve and buffer**, page 39, and allow chain to run out of the hoist.
- ▶ To replace the chain sprocket, the gearbox must be removed (see E-list).
- ▶ After replacing the chain sprocket and installing the hoist, the chain can be drawn in.

DRAWING IN THE CHAIN



Drawing in the chain



ATTENTION!

The chain supplied together with this JDN hoist is matched to the chain sprocket according to strict tolerances. In order to ensure optimum function of the chain and in order to prevent hazards, only genuine JDN chains must be installed.

- ▶ Align the new chain and check the correct number of chain links. The chain must have an odd number of chain links (feature: same position of end links). Allow chain to run into the hoist using the insertion aid¹⁾ **1**. The welds **2** must face outwards (see illustration).
- ▶ Installation of the load sleeve, clamp, buffers and buffer discs is performed as per the description in the section **Replacing load hook including load sleeve and buffer**, page 39.
- ▶ The replacement of the chain with a new one must be entered into the inspection log.

¹⁾Art.-No. see spare parts list

CHAIN BOX

In most types of application, a chain box makes a significant contribution to operational safety. Only use original JDN chain boxes on JDN Air Hoists. Constructions from other sources may represent a high safety risk. Rust on the chains increases the chance that the chain may form large piles in the box and is therefore not permissible.

Depending on the ratio of the size of the hoist (without running gear) and the chain box, the chain box may have to be stabilised by the customer due to an acceptable vertical hoist position. This is facilitated by a suspension point on the rear of the box. We will be happy to answer any questions on this matter. Modifications may only be made to the chain box on agreement with J.D. Neuhaus GmbH & Co. KG.

The chain must only enter the container via the chain drive. If it falls out of the container, e.g. during transportation, it must be run out completely on the load hook side and then run back into the container via the chain drive, in the air hoist operating position.



DANGER!

If JDN Air Hoists are operated without a chain box, it must be ensured that the idle chain (unloaded chain end) running up or down at the chain sprocket, does not present a hazard, e.g. due to catching, impacting or falling. Danger due to falling chain can also arise if, when lifting, the idle chain is first deposited on a load with a large surface or other surfaces above the traffic level, then slides off and drops.



ATTENTION!

Do not exceed the permissible filling capacity. Danger of chain falling.



DANGER!

When operated with a chain box, lubrication of the chain is particularly important in order to prevent it from piling up and falling out. Do not install longer chains when changing chains.



ATTENTION!

Loads must not be moved against the chain box when lifting loads. If necessary, attach a clamp with buffer and buffer discs to the chain. The clamp with buffer and buffer discs must be attached above the load hook so that it functions as a preliminary end position limiter (see section **Replacing chain and chain sprocket**, page 40).



ATTENTION!

Never allow the chain to pile up in the chain box.

- ▶ After installing the chain box, lower the load hook to the bottom position once.
- ▶ Then activate lifting movement and run the complete chain into the chain box once.

If the hoist has been transported with the chain in the chain box, the chain box must be emptied manually before initial operation (if necessary, remove the chain box from the hoist). The entire chain must then be allowed to run to the load side and, subsequently, be driven back into the chain box. The hoist must be kept in a hanging position during this procedure. This process will ensure that the chain does not lock when loads are being lowered.



FAULTS, CAUSE AND REMEDY

FAULT TABLE

Fault	Possible cause	Remedy
Lifting not possible	Air pressure too low	Increase air pressure to the relevant value
	EMERGENCY STOP switch is pressed	When danger is eliminated, release the EMERGENCY STOP switch
	Hand control is faulty	Have hand control repaired
Only very slow lifting is possible	Brake does not release fully	Set air pressure to the relevant value, Check seal of brake piston and change seal if necessary Check the adjustment of the brake piston (see Spare Part List)
	Brake lining worn or uneven	Replace brake lining
	Motor cover bolts loose	Tighten bolts
	Air supply hoses are leaking or loose	Check connections of air supply hose and control hoses and connect properly
	Cross section of air line too small	Use air line with sufficiently large diameter (check air pressure)
	Dirt in the service unit* Filter blocked	Clean the service unit, ensure better air quality
	Silencer is clogged	Replace the silencer elements or clean, improve air quality if necessary
	Motor vanes worn	Replace motor vanes
	Motor has run dry	Lubricate motor, Check oiler*
	Control valve on motor	Have the control valve repaired
Excessive running on during braking	Brake disc and/or brake piston worn	Replace brake disc and/or brake piston
Loud chain noise at chain sprocket	Chain dry Chain worn	Lubricate chain Replace JDN chain with new JDN chain
	Chain sprocket worn	Replace chain sprocket, check chain guide, replace if necessary
	Wrong chain drawn in	Identify chain and replace with JDN chain if necessary
Lifting or lowering speed reduced at higher lifting heights or motor comes to a standstill	Adjustment of brake piston too tight	Correct adjustment of brake piston. At high ambient temperatures perform adjustment with the device warmed up accordingly

*if installed



APPENDIX

TECHNICAL DATA

Type		mini 125	mini 250	mini 500	mini 1000
Load-carrying capacity	kg	125	250	500	980*
Number of chains		1	1	1	1
Motor rating	kW	0.4	0.4	1.0	1.0
Weight at 3 m standard lifting distance and 2 m control length	kg	9.5	10.5	21	23
Weight of 1 m chain	kg	0.35	0.35	1.0	1.0
Chain dimensions	mm	4x12	4x12	7 x 21	7 x 21
Air pressure (nominal pressure)	bar	6	6	6	6
Air consumption at nominal load - lifting	m ³ / min	0.5	0.5	1.2	1.2
Air consumption at nominal load - lowering	m ³ / min	0.7	0.7	1.6	1.6
Air connection		G ³ /8	G ³ /8	G ¹ /2	G ¹ /2
Hose size, Ø inside mm	mm	9	9	13	13
Lifting speed at nominal load	m/ min	15	8	10	5
Lifting speed without load	m/ min	40	20	20	10
Lowering speed at nominal load	m/ min	30	16	18	10
Lowering speed without load	m/ min	24	12	12	6
Standard lifting distance	m	3	3	3	3
Control length for standard lifting distance	m	2	2	2	2
Noise pressure level at nominal load - lifting	dB (A) ¹⁾	79	79	77	77
Noise pressure level at nominal load - lowering	dB (A) ¹⁾	80	80	83	83

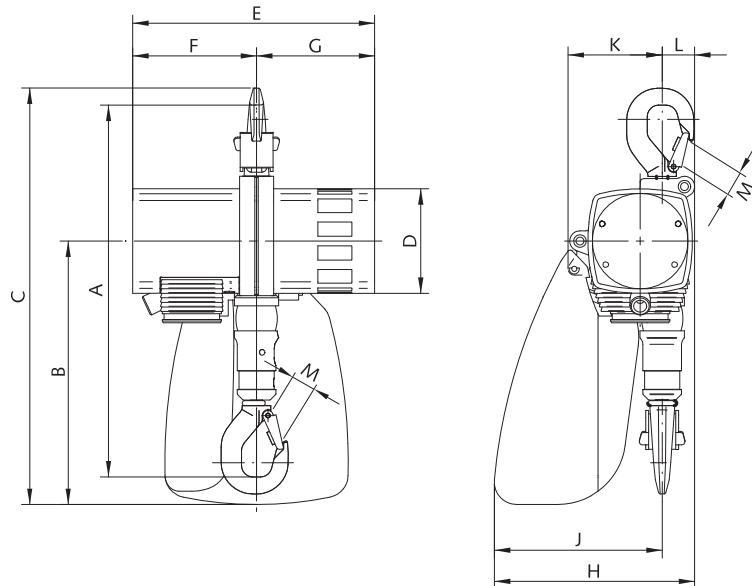
Performance values at 2 m control length

* Outside the EU 1000 kg

¹⁾ The noise pressure level of the measurement area at a distance of 1 m from the machine surface was measured in accordance with DIN 45 635, Part 20, at the excess operating air pressure specified by us. In the hall, the noise pressure level drops by approx. 3 dB (A) every time the distance is doubled.



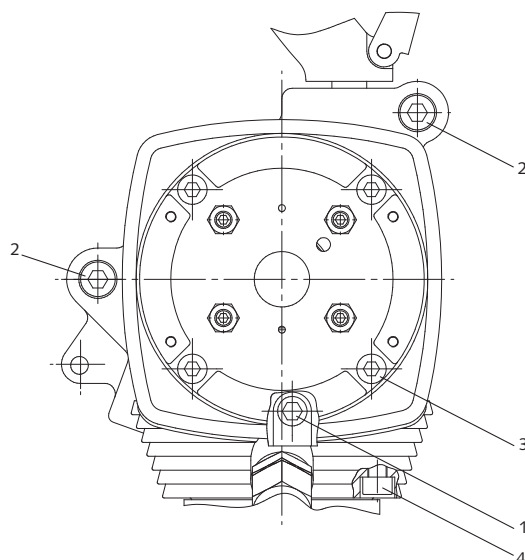
DIMENSIONS



All measurements in mm	mini 125	mini 250	mini 500	mini 1000
A	328	328	458	458
B	232	232	316	316
C	367	367	505	505
D	92	92	122	122
E	213	213	292	292
F	109	109	148	148
G	104	104	144	144
H	177	177	234	234
J	148	148	194	194
K	83	83	119	119
L	29	29	40	40
M	19	19	28	28



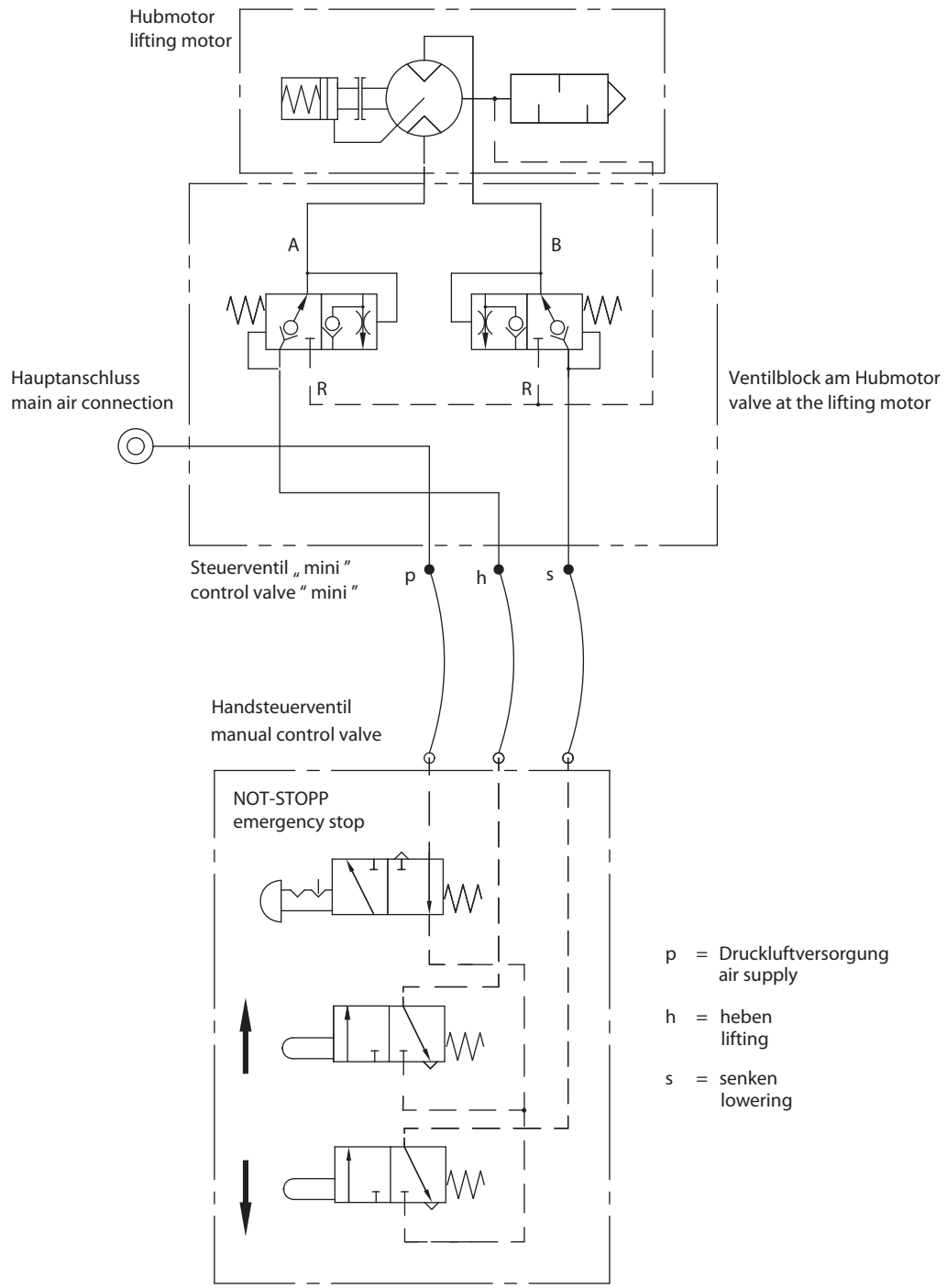
TIGHTENING TORQUES



Item	Screw	Tightening torques in Nm	
		mini 125/250	mini 500/1000
1	1 hexagon socket screw for hoist housing	8	21
2	2 hexagon socket screws for hoist housing	8	21
3	4 hexagon socket screws for cover	4.9	8
4	4 hexagon socket screws for control valve housing	3.5	6



AIR FLOW SHEET





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