

**JDN OPERATION MANUAL
AIR HOISTS**

PROFI 3 Ti, PROFi 6 Ti, PROFi 10 Ti, PROFi 16 Ti



J.D.NEUHAUS

powered by air
powered by air

This manual edition 07/2003, covers the following
JDN Air Hoists:

PROFI 3 Ti

PROFI 6 Ti

Fabr. No.

Fabr. No.

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

PROFI 10 Ti

PROFI 16 Ti

Fabr. No.

Fabr. No.

Before operating any hoist, carefully read the entire
manual. For hoists mounted in trolleys, refer also to the
JDN Trolleys Operation Manual.



TABLE OF CONTENTS

SAFETY INSTRUCTIONS

Organisational measures	5
Personnel safety	5
Preventing property damage	5

PRODUCT INFORMATION

The operation manual	6
Warnings and symbols	6
Designation	7
Assembly overview	8
Product description	8
Explosion protection	8
Intended use	14
Operating conditions	14
Energy requirements	15
Principle of operation of JDN air vane motors	16
Operation without chain box	17
Operation with service unit	17
CE designation	17
Certification	17
Spare parts	17

TRANSPORT AND STORAGE

Safe transportation	18
Storage conditions	18

INITIAL OPERATION

Unpacking	19
Assembly	19
Installing the hoist	19
Connecting the controls	20
Replacing controls	23
Connecting to the main air supply	25
Lubricants	25
Checking prior to initial operation	26

OPERATION

Rules for safe operation of hoists	27
Controls	29
Emergency stop device	31
Overload protection	31
Attaching the load	31

Lifting the load	32
Lowering the load	32
Detaching the load	32
Interrupting working	32

TAKING OUT OF OPERATION

Shutting down	33
Storage	33
Dismantling	33
Disposal	33

MAINTENANCE

Maintenance and inspection intervals	34
Cleaning and care	34
Spare parts	34
Lubricants	34
Inspection and repairs	34
Checking braking function	37
Checking direction of movement	37
Checking lifting and lowering limiters	37
Checking emergency stop function	37
Lubricating the chain	38
Checking controls	38
Checking the silencer for permeability	38
Service unit	39
Replacing brake disc and brake piston	42
Replacing vanes	42
Motor installation, motor lubrication	42
Removing and installing load sleeve, bottom block, clamp and buffer	44
Checking chain, chain sprocket and chain guides	46
Check dimensions	47
Checking axial play	48
Removing and installing chain	50
Replacing chain and chain sprocket	51
Overload protection	52

FAULTS, CAUSE AND REMEDY

Fault table	53
-------------	----

ACCESSORIES

Filter silencer	54
Booster unit	55
Chain box	55

APPENDIX

Technical data	56
Dimensions	57



J.D.NEUHAUS

powered by air

Please note!

Within the Federal Republic of Germany operators of air hoists must comply with

- ▶ UVV Winches, Lifting and pulling Devices (BGV D8)
- ▶ and UVV Load-carrying Devices used with Lifting Equipment (VBG 9a)

and, for air hoists installed in trolleys, additionally with

- ▶ UVV Cranes (BGV D6)
- in the respective currently applicable version. Operators must also initiate the prescribed tests (see also "Principles for the Testing of Cranes" BGG 905 (ZH1/27)).

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 Air 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.

All personnel charged with operating air hoists, must have read and understood the operation manual, especially the section concerning safety instructions, 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 Air Hoists are also under obligation to ensure safe and hazard-free operation. This can be achieved through the following measures:

- ▶ the operation manual must always be kept available at the hoist operating site,
- ▶ performing regular training,
- ▶ 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.
- ▶ Observe the accident prevention regulations, especially BGV D8 (Winches, Lifting and Pulling Devices) and VBG 9a (Load-carrying Devices used with Lifting Equipment).
- ▶ Ensure that you are properly informed regarding working with hazardous materials.
- ▶ Follow the safety instructions set out in this operation manual.

PREVENTING PROPERTY DAMAGE

Operators of JDN Air 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 Air Hoists for work which is described as intended use.
- ▶ Observe the operating conditions for hoists as described in this manual.



PRODUCT INFORMATION

THE OPERATION MANUAL

This operation manual is intended to help the operator familiarise himself with JDN Air Hoists and to take full advantage of their designated areas of application.

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

WARNINGS AND SYMBOLS

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



DANGER!

Safety warning, which if not followed can result in a 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 situations, which may become hazardous. Failure to observe may result in light injuries.



ATTENTION!

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

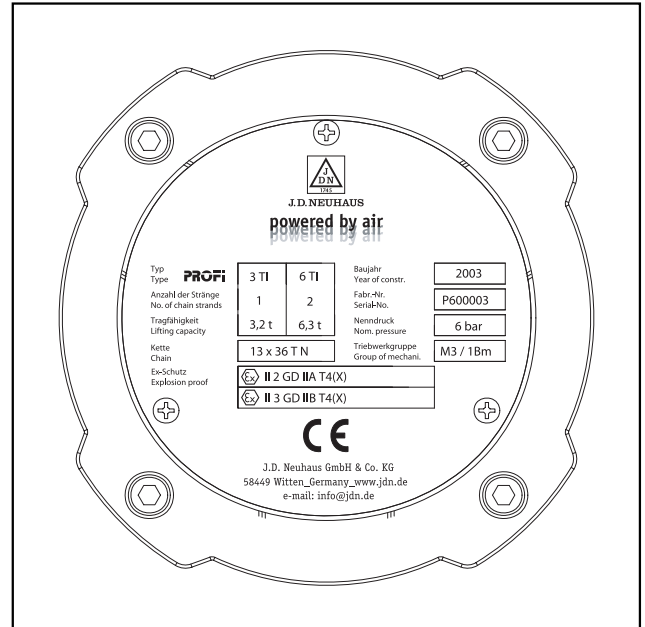
DESIGNATION

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:

J.D. NEUHAUS GMBH & CO. KG
 Windenstraße
 D - 58449 Witten-Heven

Phone +49 - 23 02 - 20 80
 Fax +49 - 23 02 - 20 82 86
<http://www.jdn.de>
 e-mail: info@jdn.de



Example of nameplate on housing cover

ASSEMBLY OVERVIEW

PROFI Ti series air hoists consist of the following assemblies:

- 1 Gearbox with chain sprocket and overload protection
- 2 Centre section
- 3 Motor with integral brake function
- 4 Controls with main air EMERGENCY STOP
- 5 Chain
- 6 Load hook with load sleeve or bottom block and buffer

PRODUCT DESCRIPTION

The **PROFI Ti** series JDN Air Hoists described here are designed for load-carrying capacities from 3.2 t (**PROFI 3 Ti**) to 16 t (**PROFI 16 Ti**). Various control devices are available for the different requirements.

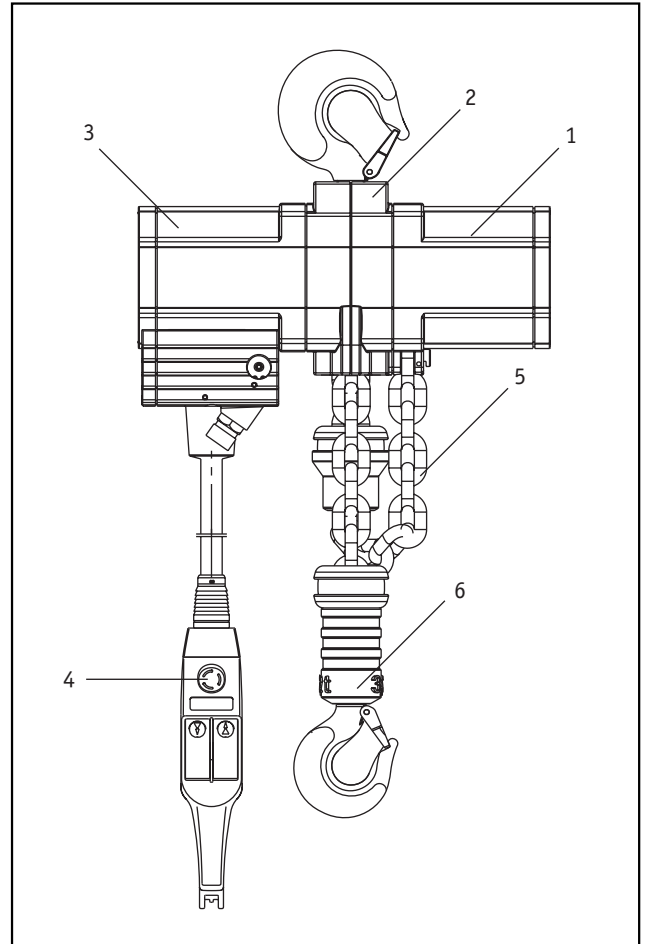
The air vane motor of the hoist, together with the appropriate controls, is capable of sensitive movement. This enables precise positioning of the load.

PROFI Ti series JDN Air Hoists conform to driving mechanism classification M3/1Bm, ISO 4301/FEM 9.511.

PROFI Ti JDN Air Hoist motors feature rotors with grease chambers. This contains JDN high-performance grease, which enables operation with oil-free compressed air. It remains effective for an operating period of approx. 250 hours and should be renewed after five years, at the latest (see **Motor lubrication**, page 43). Additional lubrication with oil-bearing compressed air by means of a service unit with oiler is possible.

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.



PROFI Ti series JDN Air Hoists

BASIC EXPLOSION PROTECTION OF THE STANDARD VERSIONS

Standard version JDN Air Hoists are category 2 devices (Guideline 94/9/EC, DIN EN 1127-1²), for use in zone 1 and 2 for gases of explosion group IIA. (see also IEC 60079-12³ and IEC 60079-20⁴). These devices are also suitable for use in zone 2, in the presence of gases of explosion group IIB, provided that the substances hydrogen sulphide and ethylene oxide can be excluded and additionally in zones 21 and 22 for dusts with glow temperatures above 210°C and ignition temperatures above 202°C, provided that no light metal or other impact-sensitive dusts are present. In zones 1 and 21, friction and impacts in the working area of the chain must be excluded.

These devices are designated by:

⊕ II 2 GD IIA T4(X) / II 3 GD IIB T4(X)



ADDITIONAL MARKING "X"

⊕ II 2 GD IIA T4(X) / II 3 GD IIB T4(X) or

⊕ II 3 GD IIA T4(X): This designation does not permit use in the presence of the extremely flammable substances hydrogen sulphide and ethylene oxide or in the presence of light metal or other impact-sensitive dusts, or in the presence of dusts with glow temperatures below 210°C and ignition temperatures below 202°C.

⊕ ... IIC T6(X): This designation permits use in the presence of carbon disulphide or other temperature class T6 substances only under special conditions, which have been agreed with the manufacturer and which are described in the crane documentation (Europe: in the inspection log) and which stipulate the maximum surface temperatures for the device.

GENERAL NOTE ON DESIGNATION

The highest possible respective designations for lifting equipment and running gear are usually replaced by a designation, which corresponds to the normal assembly of a compact complete device (trolley or crane system).

JDN HOISTS

"WITH INCREASED SPARK PROTECTION"

JDN Hoists in the "with increased spark protection" version (SP), fulfil further explosion protection requirements. With the exception of carbon disulphide, they can be used in the presence of all gases in zones 1 and 2 and dusts with glow temperatures above 210°C and ignition temperatures above 202°C and can be designated with ⊕ II 2 GD IIC T4 for installation in a trolley, depending upon trolley version (see below), but also with ⊕ II 2 GD IIB T4. For further operating conditions, see Instructions for safe operation (Notes **D**) and **E**).

JDN HOISTS FOR USE IN THE PRESENCE OF TEMPERATURE CLASS T6 GASES OR EXTREMELY EXPLOSIVE DUSTS

Following separate tests, especially with regard to ambient temperatures and type of operation, use in the presence of carbon disulphide or dusts with particularly low glow or ignition temperatures may be possible with designation ⊕ II 2 GD IIC T6(X), which includes the additional marking "X" for special conditions (see Additional marking "X").

Please contact us with regard to these requirements.

MATERIALS FOR FRICTION AND IMPACT HAZARDS

The combination of particular material pairs results 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. In zones 1 and 21, but also in zone 2 for gases of explosion group IIC, hydrogen sulphide and ethylene oxide, as well as in zone 22 for light metal and other impact-sensitive dusts, the following generally applies: 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: stainless steel) 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.

COMPRESSED AIR HOSES

In zone 1, compressed air hoses must have a sufficiently low surface resistance of less than 10⁹ Ω, in order to prevent electrostatic ignition hazards. Otherwise (resistance >10⁹ Ω), for explosion groups IIA and IIB the hoses must be Ø ≤ 30 mm and for explosion group iic Ø ≤ 20 mm, or proof must be provided that they cannot become dangerously charged.



J.D. NEUHAUS

powered by air

ACETYLENE AND COPPER

When operating JDN products in explosion-hazardous areas, in which an acetylene-containing atmosphere can occur, it must be ensured that copper-plated parts are kept dry, in order to exclude the possibility of oxidation of the metallic copper and the formation of a watery phase, which is capable of reacting with acetylene and which can result in an explosion hazard.

EARTHING

Electrostatic ignition hazards can be prevented by means of safe earthing. In zones 1 and 21, earthing of the hoists is required. This must be achieved via the load hook or the load eyes, if the lifting equipment is connected to correspondingly earthed parts (earth leakage resistance less than $10^6 \Omega$). This also applies to operation with trolleys or cranes. Their tracks must be earthed on site. Running wheels and rail surfaces must never be painted, as this can result in unacceptably high earth leakage resistance values.

Earthing of the load hook is via the chain (see also "**Load chain**" below).

Loads must be earthed during transportation. A separate earth is required, for example, when using non-conducting sling gear.

LOAD CHAIN

In order to prevent mechanical sparking in zones 1 and 21, but also in zone 2 for gases of explosion group IIC, hydrogen sulphide and ethylene oxide, as well as in zone 22 for light metal and other impact-sensitive dusts, the chain and the load must always be moved in such a way, that sliding or frictional contact with other plant and components is excluded.

In order to guarantee the required degree of earthing, rusty chains must no longer be used in zones 1 and 21. As, depending upon the degree of corrosion, the leakage capability of the chain may be impaired to a level that is no longer adequate.

EXPLOSION GROUPS AND TEMPERATURE CLASSES OF THE MOST IMPORTANT GASSES AND VAPOURS (-SELECTION-)
 (according to DIN VDE 0165⁵, Redeker⁶, Nabert, Schön⁷, 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 Naphthaline (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 sulfide	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 of the next group of class when classified in the explosion groups or temperature classes. For this reason, they have been included in both.

** : Extremely flammable substances (cf. additional marking "X")

*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 gasses and vapours)</small>	Zone	Version*1			Operation*2		
II A	2	A					
	1	A			D		
II B (X) except hydrogen sulphide, ethylene oxide (particularly flammable)	2	A					
	1	A	FS		D		
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					
	21	A			D		
Light-metal or impact-sensitive dusts	22	A	FS		D		
	21	A	FS		D		

***1: Features:**

- 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 bronzed or are made of bronze.

***2: Instructions for safe operation:**

- 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. This applies in particular to use in conjunction with light metals or light metal alloys. (exception: stainless steel)
- E** : A gas-free or spark-free environment must be ensured in the working area. 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.
- T** : Ambient temperature and the type of operation must be examined separately. Equipment surface temperatures are dependent upon the type of operation and the ambient temperature. Therefore, separate testing is required for materials of the temperature classes T5 and T6. A maximum ambient temperature of 40°C is a pre-condition for the specification of temperature class (see also EN 50014⁸).

**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 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 12/97⁹ "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 DIN VDE 0165: Installation of electrical systems and equipment in areas with explosion hazard, 1991
 - ⁶ Nabert, Schön: Sicherheitstechnische Kennzahlen brennbarer Gase und Dämpfe 2nd edition, 1978
 - ⁷ Redeker, Schön: 6. Nachtrag zu Sicherheitstechnische Kennzahlen brennbarer Gase und Dämpfe, 1990
 - ⁸ DIN EN 50014 (VDE 0170/0171 part 1): 2000-02
Electrical apparatus for use in explosion hazardous areas: General provisions
 - ⁹ HVBG/BIA-Report 12/97: Central association of German employer's liability associations/Trade association institute for industrial safety



J.D. NEUHAUS

powered by air

INTENDED USE

PROFIT 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. Under certain conditions, the lifting of personnel-carrying equipment is also permitted.

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 abnormal. Oblique pulling, see section **Operation**, page 27. J.D. NEUHAUS GMBH & CO. KG cannot be held liable for any resulting damage. The entire risk is borne by the user (see also section **Rules for safe operation of hoists**, page 27).

Intended use also includes observance of the operation manual and compliance with the inspection and maintenance conditions.

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 temperatures of -20°C up to approx. +70°C. The thermal endurance of chains and hooks is +150°C.



CAUTION!

When touching metallic hand controls which are colder than 0°C, freezing of the skin can occur within a few seconds and for temperatures above 43°C, burns can occur.

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. 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.



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 5 mg/m³

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 case your JDN Air Hoist is operated in combination with a trolley, please read also 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 table **Technical data**, page 56.

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 .

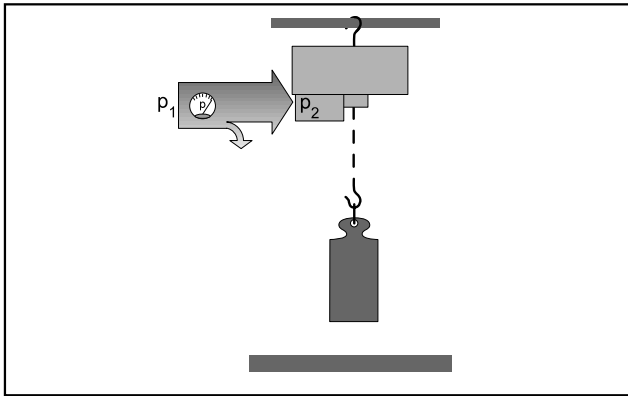
The value of the actual pressure p_2 at which the hoist is operated, depends upon

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

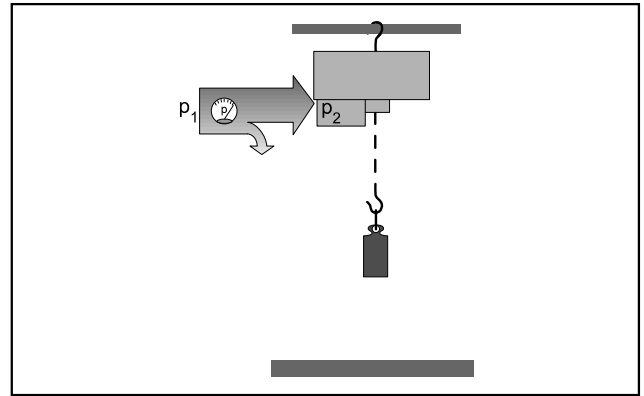
When lifting the nominal load (load-carrying capacity), the actual pressure p_2 must not fall below a value 10% below the specified nominal pressure of the hoist.

Example:

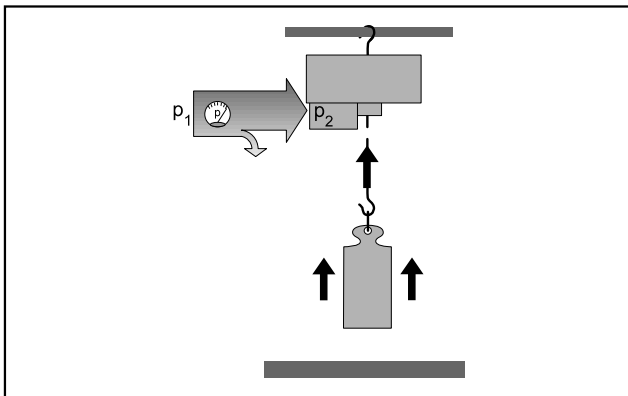
A hoist with a nominal pressure of 6 bar lifts its nominal load at the specified lifting speed, at an actual pressure of 5.4 bar.



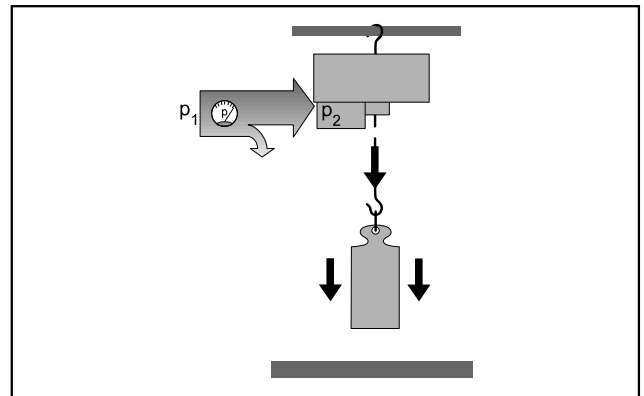
The value of the actual pressure depends upon ...



... the weight of the load ...



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



J.D. NEUHAUS

powered by air

**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**.

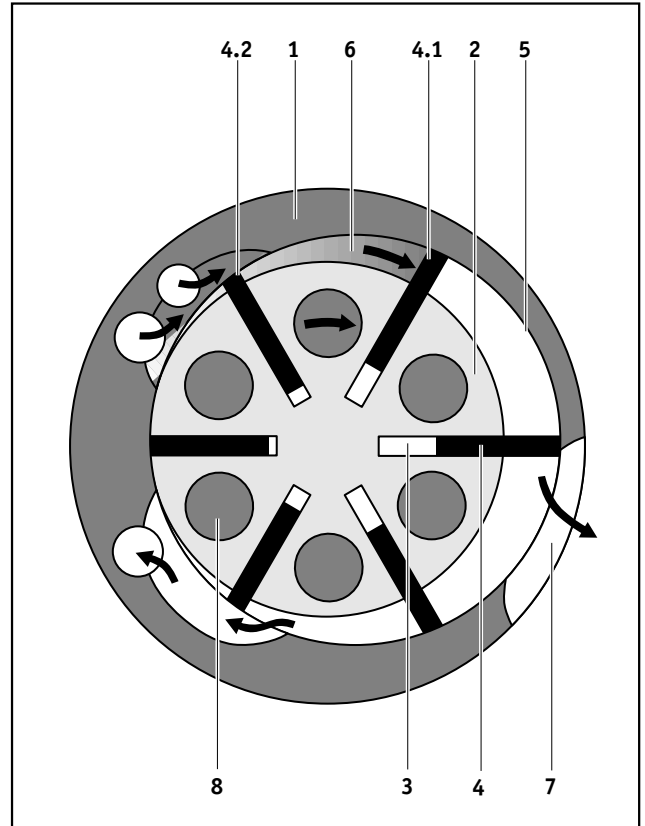
The vanes can move freely and make contact with the inner wall **5** of the cylinder liner. Each chamber is formed by two vanes **6**.

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.

Lubricant chambers **8** are provided between the vane slots of the rotor. They ensure continual motor lubrication over a period of 250 - 500 operating hours (depending upon motor type).

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.

CERTIFICATION

Each JDN Air Hoist is delivered with a factory certificate.

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.

OPERATION WITH SERVICE UNIT

JDN Air Hoists are provided with motor lubrication, which is sufficient for approx. 250 operating hours. 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.

CE DESIGNATION

Only hoists which have a CE designation may be operated within the EU.



J.D. NEUHAUS

powered by air

TRANSPORT AND STORAGE

SAFE TRANSPORTATION

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

- ▶ Set the housing down carefully; do not allow to drop. Weight of hoist, see **Technical data**, page 56.
- ▶ Lay control and supply hoses together in such a way that they are not kinked.
- ▶ 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 grease packing of the rotor is not renewed after 250 operating hours, the motor must be conserved. 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.
- ▶ 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 56.



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:

- ▶ **control connection** (page 20)
- ▶ **Removing and installing chain** (page 50)
- ▶ **Chain box** (page 55)

In the case 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 PAGE 38).**

HOIST INSTALLATION



DANGER!

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



DANGER!

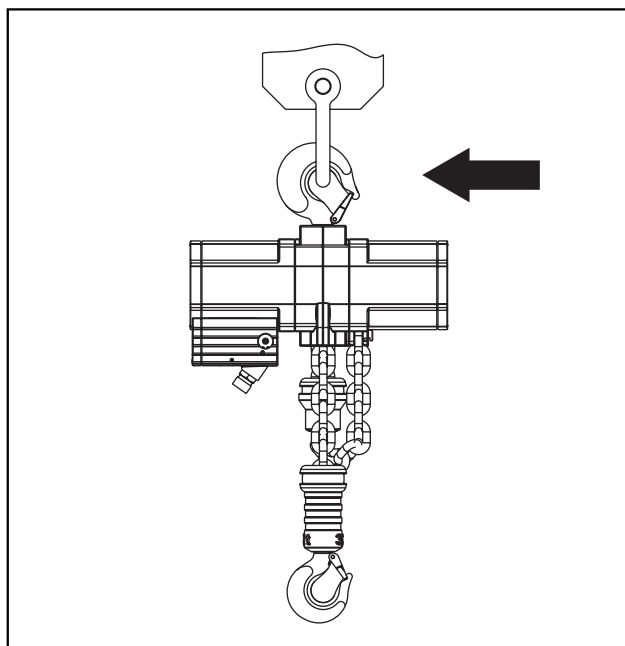
The attachment points for JDN Air Hoists must be able to safely withstand the expected forces.



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.



J.D. NEUHAUS

powered by air

CONNECTING THE CONTROLS

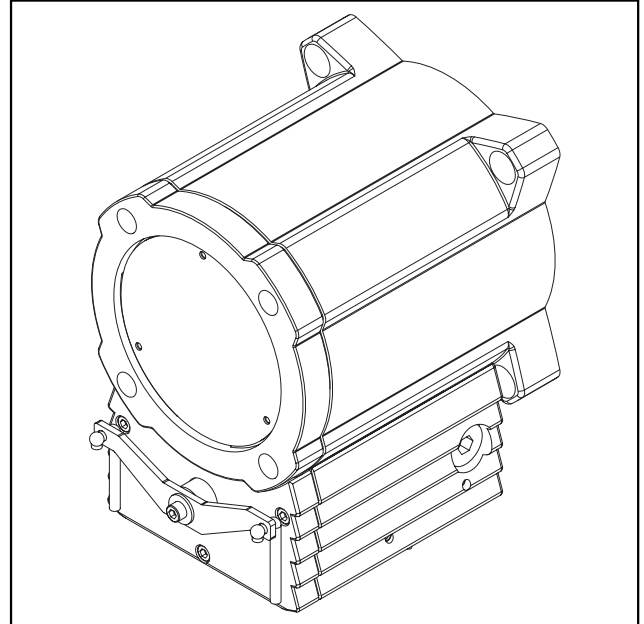
CONNECTING THE ROPE CONTROLS

- ▶ Knot both control ropes at the ends of the control lever.
- ▶ Knot the green pin into the rope which activates "lift" mode, with the pointed end upwards.
(See also illustration **Rope control** page 31)
- ▶ Knot the yellow pin into the rope which activates "lower" mode, with the pointed end downwards.
- ▶ Knot the handle into the rope so that the arrow markings correspond to the actual direction of movement.

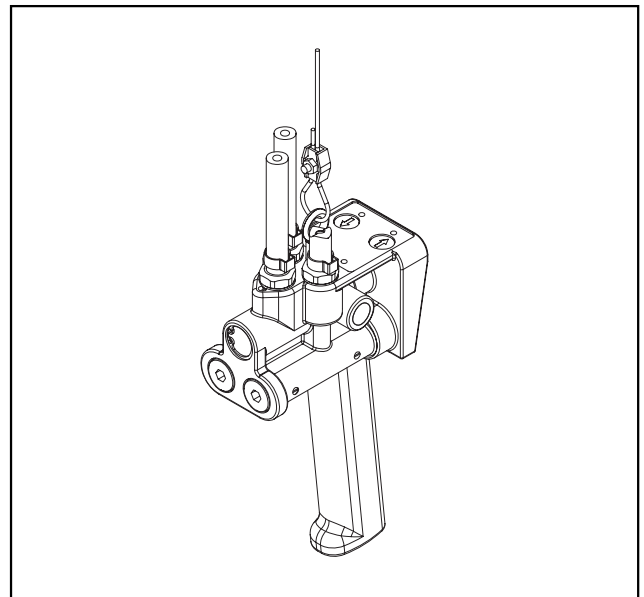
E-CONTROL CONNECTION

Pushbutton valve (hand control)

- ▶ Guide the strain-relief rope through the eye on the pushbutton valve and secure using the rope clamp.
- ▶ Push the one-ear clamps onto the hose ends.
- ▶ Attach the hoses to the hose nipples.
- ▶ The one-ear hose clamp must lie in the middle of the hose nipple clamping range. The best clamping characteristics can be achieved in this range.



Rope control, motor side



Pushbutton valve with nipples and rope with designation lift and lower

- Secure the hoses using the one-ear hose clamps and crimping tool.



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

- The bellows must be pulled over the other end of the hose bundle including the strain-relief rope (coat hose bundle with oil for ease of fitting). Pull the bellows back far enough to permit further installation. Push the one-ear clamps onto the free ends of the hoses.

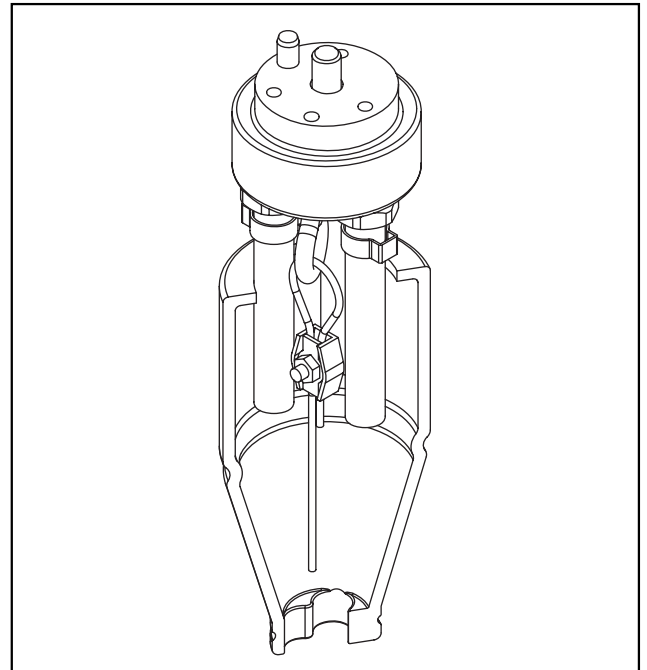


Illustration of bellows with hoses and strain-relief rope



J.D. NEUHAUS

powered by air

Control valve (on motor)

Note: In order to connect the hoses to the control valve, we recommend removal of the hose adapter.

- ▶ Remove the hose adapter (secured via central bolt).
- ▶ Attach the hoses to the corresponding nipples (see designation in illustration)
- ▶ Secure the hoses using the one-ear hose clamps and crimping tool.
- ▶ Secure the strain-relief rope.



ATTENTION!

The strain-relief rope must be installed with the correct length, in order to prevent loading of the hoses.

- ▶ Pull the bellows over the hose adapter. The upper collar of the bellows fits into the recess of the hose adapter.
- ▶ In order to secure the hose adapter to the control valve, a long A/F 6 socket spanner must be guided between the three hoses, through the middle of the bellows and inserted into the hexagon socket of the bolt.

F-CONTROL CONNECTION

Pull the bellows over the hose bundle for F-control. For F-control for lifting and lowering only, remove approx. 80 mm of hose bundle protective sheathing; for F-controls with additional functions (trolley/crane movement) remove approx. 160 mm from end of protective sheathing.

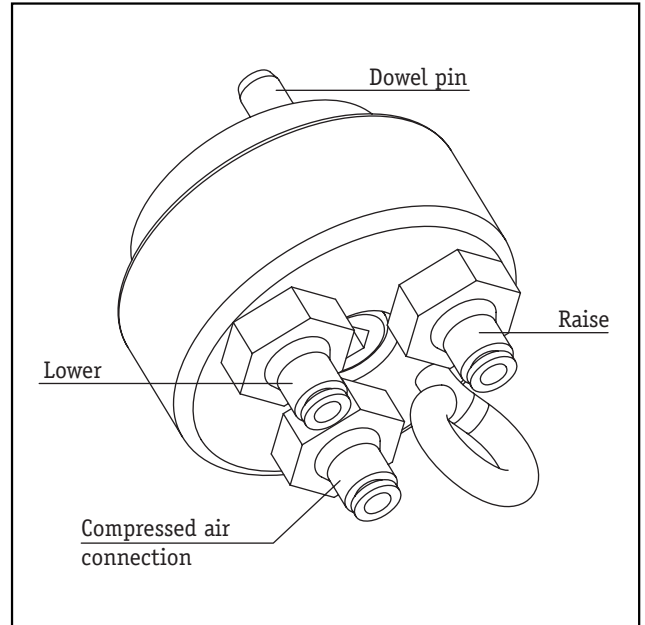
Pull the strain-relief ropes through the eye bolt and secure using rope clamps.

Insert the control hoses: See illustration above

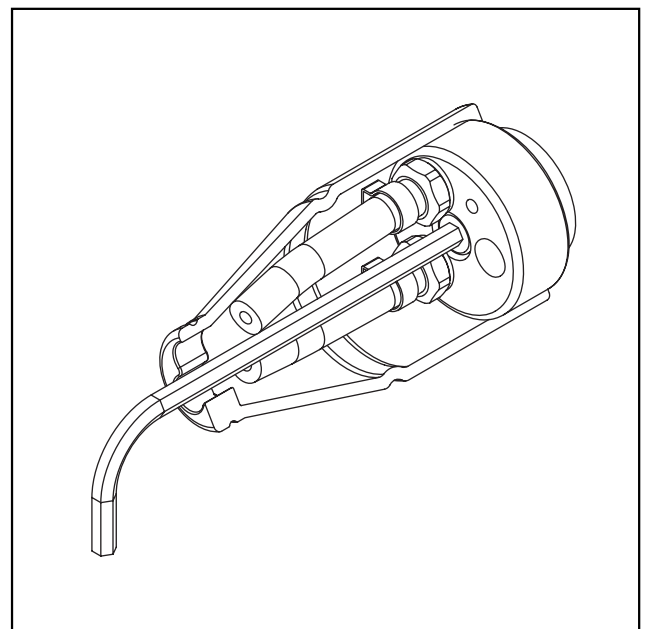
Compressed air
with hose designation 1 or colour: white

Movement direction "lift"
hose designation 2 or colour: green

Movement direction "lower"
hose designation 3 or colour: red



Hose adapter with nipples designation lift, lower



Bellows with A/F 6 socket spanner

The control hoses for the drive motors (trolley/crane movement) must be extended, outside of the bellows, by means of plug-in connectors and additional control hoses. **Connection** see "Trolley" operation manual.

**ATTENTION!**

The control hoses must not be subject to tensile load; adjust the strain-relief ropes accordingly.

Pull the bellows over the hose adapter and secure via the central bolt, (see illustration on page 22, bottom).

FI-CONTROL CONNECTION

Pull the bellows over the hose bundle for F-control. Remove approx. 80 mm of hose bundle protective sheathing.

With this type of control, strain-relief of the hand controls is via the protective sleeve of the hose bundle. For this purpose, the protective sleeve is pushed onto the hose carrier and is secured using a one-ear clamp.

Installation facilitation: Heat the protective sleeve (hose sheathing) with a hot-air gun and grease the hose carrier.

Slightly bend open the ring of the eye bolt in order to attach the hose carrier.

Close the ring again to prevent detaching.

Insert the control hoses:

See illustration on page 22, top.

Compressed air
with hose designation 1 or colour: white

Movement direction "lift"
hose designation 2 or colour: green

Movement direction "lower"
hose designation 3 or colour: red

**ATTENTION!**

The control hoses must not be subject to tensile load; adjust the strain-relief ropes accordingly.

Pull the bellows over the hose adapter and secure via the central bolt, (see illustration on page 22, bottom).

REPLACING CONTROLS

If you wish to exchange air controls E, F or FI, proceed as follows, (see illustrations in section Connecting the controls)

CONVERSION FROM E TO F

Control valve housing (on motor)

Removal of E-controls

Remove the hose adapter (secured by central bolt). For removal of the hose adapter, a long A/F 6 socket spanner must be guided through the middle of the bellows and inserted into the hexagon socket of the bolt, (illustration on page 22, below).

Pull the bellows back over the hose until the hose nipples with the one-ear clamps are exposed and further removal is possible.

Detach the strain-relief rope and remove the one-ear clamps, (see illustration **Removal**, page 21).

Cut off the hoses below the hose nipples using a knife. Unscrew the hose nipples (A/F 17).

Pull the bellows over the hoses of the E-controls. This is also required for the F-controls.

Installation of F-controls

Pull the bellows over the hose bundle for F-control. Remove approx. 80 mm of the hose bundle protective sheathing or 160 mm for additional movements. Screw the "straight screw connections" (Steck-fix) for 4 mm hoses into the hose adapter (A/F 16). Pull the strain-relief ropes through the eye bolt and secure using rope clamps.

Insert the control hoses:

See illustration on page 22, top.

Compressed air
with hose designation 1 or colour: white

Movement direction "lift"
hose designation 2 or colour: green

Movement direction "lower"
hose designation 3 or colour: red



J.D. NEUHAUS

powered by air



ATTENTION!

The control hoses must not be subject to tensile load; adjust the strain-relief ropes accordingly.

Pull the bellows over the hose adapter and secure via the central bolt, (see page 22, bottom).

CONVERSION FROM E TO FI

Removal of E-controls as previously described (page 23).

Installation of FI-controls

Pull the bellows over the hose bundle for FI-control. Remove approx. 80 mm of hose bundle protective sheathing.

Screw the "straight screw connections" (Steck-fix) for 4 mm hoses into the hose adapter (A/F 16).

With this type of control, strain-relief of the hand controls is via the protective sleeve of the hose bundle. For this purpose, the protective sleeve is pushed onto the hose carrier and is secured using a one-ear clamp.

Installation facilitation: Heat the protective sleeve (hose sheathing) with a hot-air gun and grease the hose carrier.

Slightly bend open the ring of the eye bolt in order to attach the hose carrier. Close the ring again to prevent detaching.

Insert the control hoses:

See illustration on page 22, top.

Compressed air with hose designation 1 or colour: white

Movement direction "lift" hose designation 2 or colour: green

Movement direction "lower" hose designation 3 or colour: red



ATTENTION!

The control hoses must not be subject to tensile load; adjust the strain-relief ropes accordingly.

Pull the bellows over the hose adapter and secure via the central bolt, (see illustration on page 22, bottom).

CONVERSION FROM AIR CONTROL TO ROPE CONTROL



ATTENTION!

Only air controls without upstream mainstream valve can be converted to rope control.

Removal of air controls

Remove the hose adapter (secured by central bolt). For removal of the hose adapter, a long A/F 6 socket spanner must be guided through the middle of the bellows and inserted into the hexagon socket of the bolt, (illustration on page 22, below).

The cover "1" in the axis centre must be removed (M 6 bolt, A/F 5).

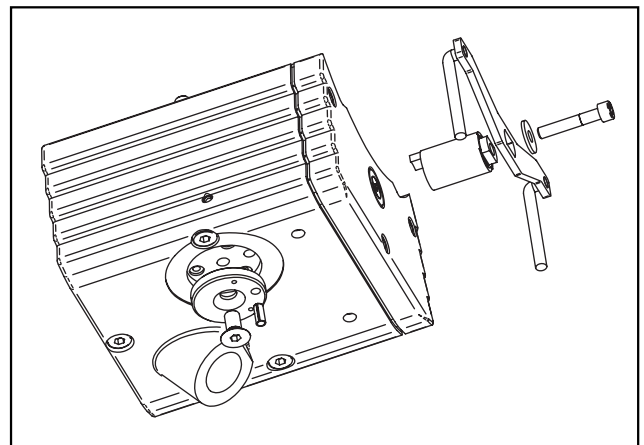
Installation of rope controls

The connecting surface of the hose adapter on the valve housing is closed off with a disc, (from conversion kit Art. no.: 13590, item 10) and is secured with the M 8 x 16 countersunk screw (item 50).

The dowel pin (roll pin, item 70) must be inserted in the bore "2" provided.

Insert the rope control lever connector (item 20) into the cover bore with the lug "3" facing upwards; push on the control lever (item 30) and secure with the M6 x 35 bolt (item 40) and washer (item 60).

Guide the control ropes "4" through the bores "5" in the lever and knot them. Rope colour: "green" lift, "red" lower. Further, see section **Connecting the rope controls**, page 20.



Installation of rope 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 housing. 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.

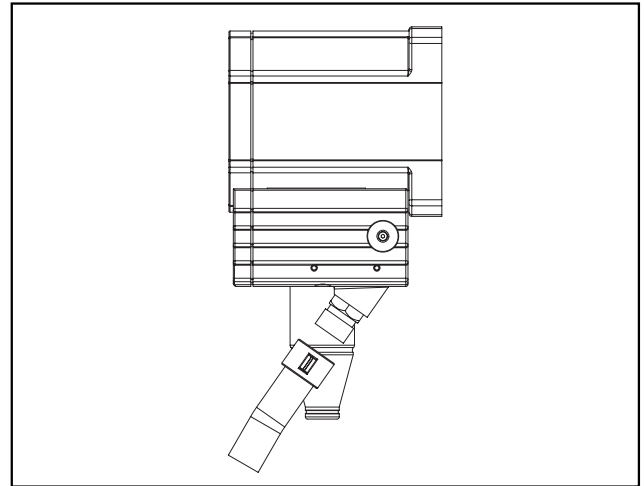


ATTENTION!

Potential motor damage! Do not mix synthetic oils with mineral oils, as the physical and thermal properties may be impaired.

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	Consumable
Motor lubrication - from factory - when operating with oiler	- JDN high-performance grease, Art. no. 11901 (1 kg) Art. no. 11902 (40 g) - Compressed air oil "D", kinematic viscosity approx. 30 mm ² /s (cSt) at 40°C, with anti-icing agent where applicable
Chain lubrication	Automobile motor oil, kinematic viscosity approx. 150 mm ² /s (cSt) at 40°C, or special lubricant from J.D. NEUHAUS
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: -30°C to +120°C, designation according to DIN 51825: KP2K-30, active agents: EP additives (for wear-reduction) and ageing protection; water resistant and corrosion protection



J.D. NEUHAUS

powered by air

CHECKING PRIOR TO INITIAL OPERATION

Hoists, including the supporting structure, must be inspected by an appropriately trained and qualified person before initial operation and following significant modifications. Hoists 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).

The description of the inspection can be found in the chapter **Maintenance**, page 37 and 52.

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).
- ▶ Observe the section "**Intended use**" on page 14.

The following are classified as non-intended use:

- ▶ 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, depending upon the particular situation, JDN Air Hoists may be used for oblique pulling. 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 devices installed in trolleys. 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 14).
- ▶ Jog control over long lift paths
- ▶ Switching to the opposite direction with load in motion.
- ▶ Operational reaching of lifting and lowering limiters.
- ▶ Do not allow safety clutch to slip following actuation due to overload.



J.D. NEUHAUS

powered by air

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 when using JDN Air Hoists, it is essential that the following points are observed:

- ▶ Never touch a running chain.
- ▶ 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.
- ▶ Never use the hoist chain for attaching loads.
- ▶ Before attaching, arrange the load exactly vertically below the hoist. The chain must hang vertically before lifting.
- ▶ Ensure that the hook safety catch is closed.
- ▶ Never allow loads to fall into the harness of the hoist.
- ▶ Before lifting loads, ensure that the maximum permissible load is not exceeded. Attaching aids must be included in the weight of the load.
- ▶ If the chain is slack, do not take up the load at maximum speed.
- ▶ 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.
- ▶ When operating without a chain box, avoid hazards due to idle chain (falling, catching, impacting), see section **Operation without chain box**, page 17.
- ▶ Only use original JDN chain boxes.
- ▶ Only lift one load at a time; never several loads simultaneously.
- ▶ Never apply bending loads to chains.
- ▶ 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.
- ▶ Do not join or repair hoist chains.
- ▶ Replace deformed load hooks.
- ▶ 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 compressed air.
- ▶ Do not exceed the permissible capacity of the chain box.
- ▶ Repair the hoist if the braking distance is excessive.
- ▶ Check blocked chains for damage.
- ▶ 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.
- ▶ 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, other parts of device: -20°C to +70°C.
- ▶ 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.



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!

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 the operating conditions.

Furthermore, it is essential that all the regulations set out in sections **Intended use** and **Operating conditions**, page 14, are observed.

CONTROLS

JDN Air Hoists can be equipped with various control devices. All are suitable for use in explosion-hazardous areas.

All control switches return to the zero position when released.

CONTROL VALVE ON MOTOR

Air control (E-, F-, FI-control) with MS

Control valve with upstream main-stream valve

The control valve consists of:

1. Main-stream valve
2. Direction control valve as rotary valve
3. Positioner (pneumatic actuation)

The main-stream valve lies upstream from the rotary valve. If no control pressure is present, this valve is closed and the rotary valve is depressurised. If control pressure is applied from the hand control, the valve opens and releases the main stream.

If the red EMERGENCY STOP button on the hand control is pressed, all control lines are depressurised and the main-stream valve is closed.

The rotary valve positioner is mechanically connected to the rotary valve drive.

The positioner is actuated by the control air.

Air control (E-, F-, FI-control)

Control valve without upstream main-stream valve

The control valve consists of:

1. Direction control valve as rotary valve
2. Positioner (pneumatic actuation)

The rotary valve positioner is mechanically connected to the rotary valve drive.

The positioner is actuated by the control air.

Rope control

Control valve without upstream main-stream valve

The control valve consists of:

1. Direction control valve as rotary valve
2. Positioner

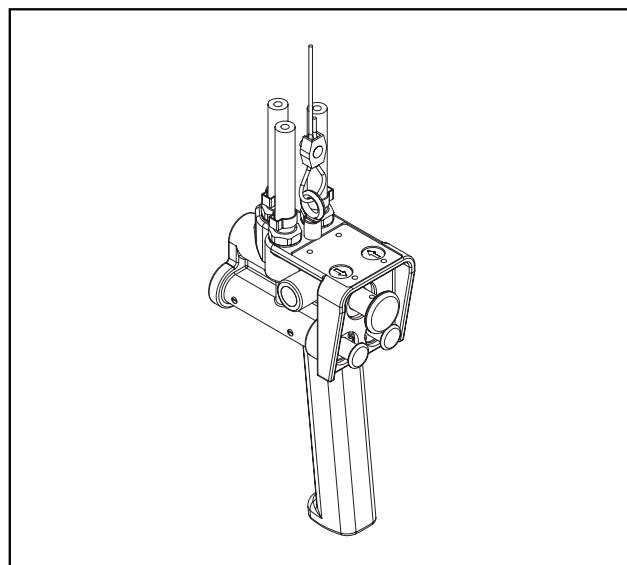
The rotary valve positioner is mechanically connected to the rotary valve drive.

For the purpose of actuation, the rotary valve is connected directly to the control lever.

E-CONTROL

With E-control, lifting and lowering movements can be controlled via two pushbuttons. The direction of movement of the load hook is marked on the upper side of the valve housing, above the pushbuttons.

- ▶ Lift: Press the right pushbutton.
- ▶ Lower: Press the left pushbutton.



E-control with EMERGENCY STOP button



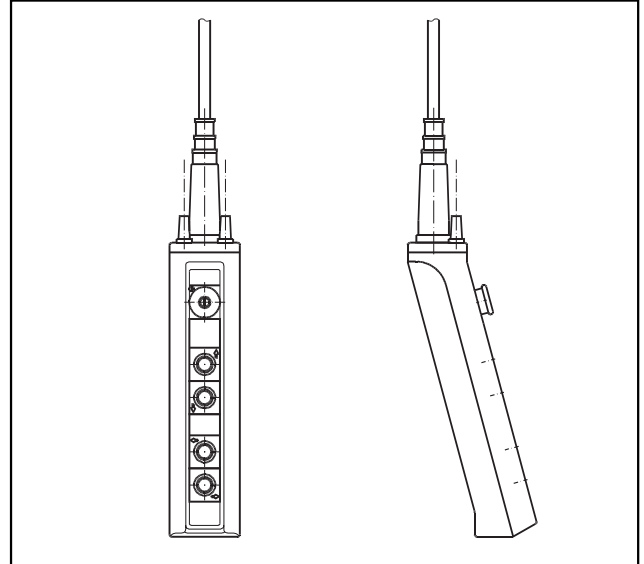
J.D. NEUHAUS

powered by air

PUSHBUTTON F-CONTROL

With pushbutton F-control, lifting and lowering movements can be controlled via two pushbuttons. The direction of movement of the load hook is marked by arrows next to the pushbuttons.

- ▶ Lift: Press the upper pushbutton.
- ▶ Lower: Press the lower pushbutton.

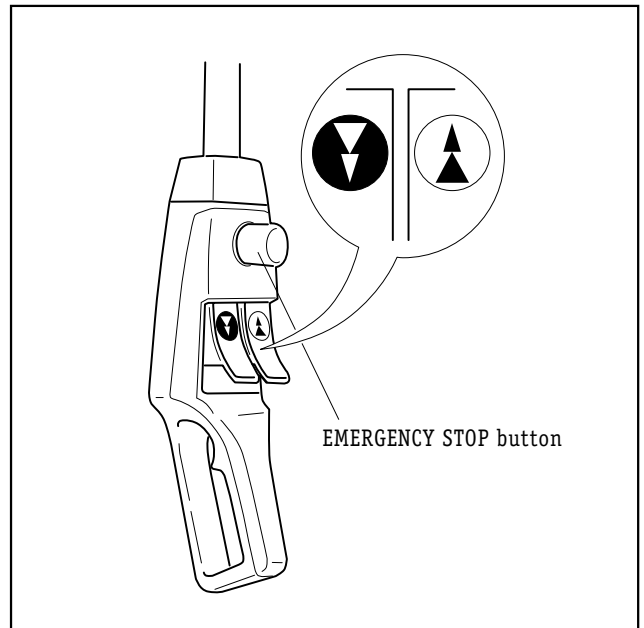


F-control with EMERGENCY STOP button

LEVER FI-CONTROL

With lever FI-control, lifting and lowering movements can be controlled via two levers arranged side by side. The control pressure is infinitely variable, enabling precise positioning of the load. The direction of movement of the load hook is marked by arrows on the levers.

- ▶ Lift: Carefully press the right lever. The load is lifted slowly.
- ▶ Press the lever further down, in order to increase the lifting speed.
- ▶ Release the lever slightly, in order to reduce the lifting speed.
- ▶ Lower: Carefully press the left lever. The load is lowered slowly.
- ▶ Press the lever further down, in order to increase the lowering speed.
- ▶ Release the lever slightly, in order to reduce the lowering speed.



FI-control with EMERGENCY STOP button

EMERGENCY STOP DEVICE

Within the EU, these controls are equipped with an EMERGENCY STOP device (optional outside the EU).

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 turning clockwise. It jumps back into place.



DANGER!

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

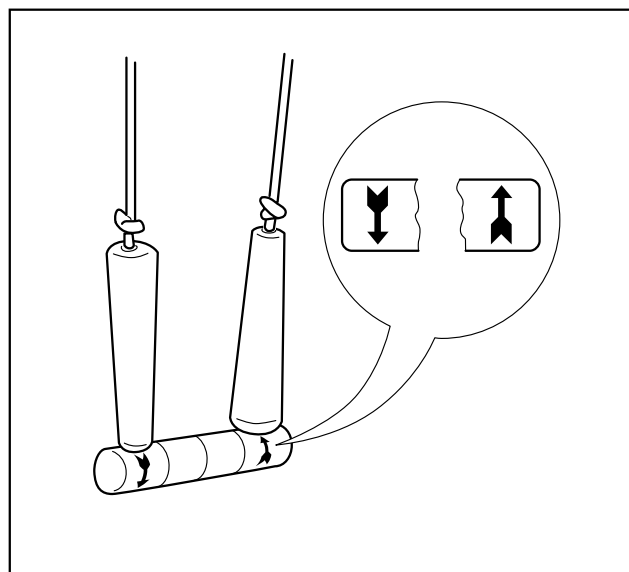
ROPE CONTROL

With rope control, the lifting and lowering movements are controlled directly. Both rope ends are connected to one another via a handle, enabling precise one-hand operation. The direction of movement is marked by arrows on the handle.

The control elements for rope control and the energy-switching component of the control valve on the motor (reversing valve), are positively connected to one another. This connection is designed in such a way, that in an emergency, the control valve can be reset to a stable neutral position. Thus, no additional EMERGENCY STOP device is required.

- ▶ Lift: Carefully pull on the green rope with the green handle pin. The load is lifted slowly.
- ▶ Pull harder on the rope, in order to increase the lifting speed.
- ▶ Release the rope slightly, in order to reduce the lifting speed.

- ▶ Lower: Carefully pull on the red rope with the red handle pin. The load is lowered slowly.
- ▶ Pull harder on the rope, in order to increase the lowering speed.
- ▶ Release the rope slightly, in order to reduce the lowering speed.



Rope control

OVERLOAD PROTECTION

Your hoist is equipped with a direct-acting overload protection in the form of a new type of safety clutch. With this safety clutch, overloading can be limited to 120 % of load-carrying capacity, without the danger of failure due to the load running back.

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.

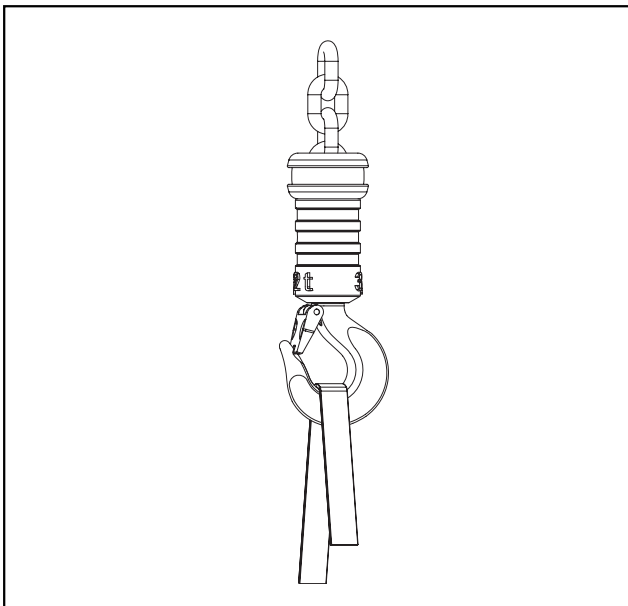


J.D. NEUHAUS

powered by air

In Germany, the Safety Regulations for Load-carrying Devices used with Lifting Equipment must be observed (VBG 9a). 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 is aligned and the material is protected.
- ▶ Then lift the load.

For loads in excess of 120 % of load-carrying capacity, the overload protection interrupts the lifting procedure.

LOWERING THE LOAD



DANGER!

Ensure that there are no persons below the load.

- ▶ Then lower the load.



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.

- ▶ 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 (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 the hoist and remove.

DISPOSAL

JDN Air Hoists contain a range of materials which, on expiry of the service life, must be disposed of or recycled, possibly in accordance with statutory legislation.

Please note the following list of materials used:

HOIST

- ▶ Ferrous materials
 - Steel
 - Nodular cast iron
- ▶ Non-ferrous metals
 - Bronze
 - Aluminium
- ▶ Plastics
 - Polyurethane
 - Polyoxymethylene
 - Polyvinyl chloride
 - Polyamide, glass-fibre reinforced
 - Natural rubber
 - Polypropylene
 - Phenol resin
 - Thermoset moulding compound (Asbestos-free brake lining)
 - Synthetic rubber

FILTER SILENCER/ SERVICE UNIT:

- Zinc diecast
- Brass
- Nitrile rubber
- Aluminium
- Polypropylene
- Polyurethane
- Glass-fibre reinforced plastic
- Steel
- Polyacetal
- Polyethylene



J.D. NEUHAUS

powered by air

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. It is essential that the intervals are shortened under particularly wear-promoting operating conditions.



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 the hoist and the chain of dirt contamination,
- ▶ seal off the air supply connections,
- ▶ 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 25)

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 provided 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).

$$f_v = 1 + 0,5 \frac{P-50}{50} \text{ (for } P > 50\%)$$

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 contains a model for determining the actual operating time.

A general overhaul must be performed, when the theoretical operating time has been achieved. Detailed explanations for the determination of the actual operating time and its documentation can be found in the national safety regulations. 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.

Dismantling the hoist, see page 33.



CAUTION!

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



J.D. NEUHAUS

powered by air

Maintenance measure	Interval	Comment
Check oil level for motor lubrication (when operating with oiler)	Daily	(Section Filling and adjusting oiler , page 41)
Lubricate chain	As required	(Section Lubricating the chain , page 38)

Inspection measure	Interval	Comment
Check control equipment	Daily	(Section Checking controls , page 38)
Check braking function	Daily	(Section Checking braking function , page 37)
Lifting and lowering limiters (buffers), visual check	Daily	Replace buffer immediately if damaged, otherwise replace every 5 years
Lifting and lowering limiters	Check at least once annually	(Section Checking lifting and lowering limiters , page 37)
Check EMERGENCY STOP button	Daily	
Check chain	Every 3 months	(Section Checking chain, chain sprocket and chain guides , page 46) in the case of wear promoting conditions, reduce interval between checks
Check chain and chain guides	Each time the chain is changed	(Section Wear dimensions , page 48)
Check break with load	Every 250 hours, At least once annually	The load must be braked reliably (Section Checking brake function , page 37)
Check all bolted and pin connections	Every 250 hours, At least once annually	
Check load hook (load and carrying sides)	Every 250 hours, At least once annually	(Section Check dimensions , page 47)
Check the motor	Every 250 hours, At least once annually	Measure the lifting speed
Check the axial movement of hooks and eyes	Annually	(Section Checking axial play , page 48)
Check service unit	Annually	(Section Service unit , page 39)
Check silencer for permeability	Annually	(Section Checking silencer for permeability , page 38)
Check overload protection	Annually	(Section Checking and adjusting overload protection , page 52)
Check gearbox and perform lubricant change	Every 800 hours, At least every 5 years	
Shaft connection, Check the rotor pinion shaft	Every 800 hours, At least every 5 years,	
Renew grease lubrication of motor	Every 250 hours, At least every 5 years	(Section Motor lubrication , page 43)
Check compressed air connections for damage	Annually	
Check brake wear and motor vane wear	Every 800 hours, At least every 5 years	(Section Replacing brake disc, brake piston and vanes , page 42)



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.

When checking the braking function under load, the following braking distances must not be exceeded:

BRAKING DISTANCES UNDER NOMINAL LOAD (LOAD-CARRYING CAPACITY)

Type	3 TI	6 TI	10 TI	16 TI
Rope control	36	15	18	10
All others Controls with hose lengths of 2 m	48	22	26	14

Dimensions in mm

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

- ▶ Move the unloaded load hook until just short of the upper and lower end positions.
- ▶ Stop immediately before reaching the end position and then carefully (by repeatedly pressing the control element) move to the end position.
- ▶ The movement of the chain must be stopped due to deformation of the buffer and activation of the safety clutch. The motor is however not switched off (only allow the safety clutch to act for a short time).
- ▶ Following successful testing, the buffer must be unloaded.



DANGER!

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

CHECKING EMERGENCY STOP FUNCTION

- ▶ Activate lifting movement and with the control element pressed, press the red EMERGENCY STOP button. The lifting movement must be stopped immediately. Release the EMERGENCY STOP button again.
- ▶ Activate lowering movement and with the button pressed, press the red EMERGENCY STOP button. The lowering movement must be stopped immediately. Release the EMERGENCY STOP button again.



J.D.NEUHAUS

powered by air

LUBRICATING THE CHAIN



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. Furthermore, hazards arise due to rusty chains when operating with chain boxes, as the chain can form a heap and fall over the edge of the container rim. In addition, rusty chains are subject to extreme wear.

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

- ▶ Clean heavily contaminated chains.
- ▶ Lay the chain in a suitable container.
- ▶ Spray the chain with 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 CONTROLS

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.
- ▶ 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 turning.



DANGER!

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

CHECKING THE SILENCER FOR PERMEABILITY

Independent of the stipulated inspection intervals, the silencer must be checked for permeability if the hoist does not achieve the specified lifting speed (see section **Technical data**, page 56).

The test is performed by comparing the lifting speeds under nominal load, with and without the silencer. The speed with standard silencer or filter silencer must be at least 80% of the lifting speed without a silencer element.

In the case of lower values, the silencer elements must be cleaned or replaced.



SERVICE UNIT



ATTENTION!

If a hoist is operated with a service unit, this should not be mounted further than 5 m away from the hoist.

The service unit consists either of two elements, filter controller and oiler, or of the filter controller only.

CHECKING AND ADJUSTING THE FILTER CONTROLLER *)

The filter controller is set to an actual pressure of 5.4 bar (3.6 bar) in the factory (actual pressure with motor running).

In this setting, the manometer can indicate a pressure of over 6 bar (4 bar) with the motor switched off.

For correct adjustment, a pressure of at least 7 bar (5 bar) upstream of the service unit is required.

- ▶ Lift the regulator knob.
- ▶ Turn the regulator knob until the manometer indicates a pressure of 5.4 bar (3.6 bar).
Clockwise: higher pressure
Anti-clockwise: lower pressure
- ▶ Lock the regulator knob by pressing it down.

Alternatively, the filter controller can be set to a pressure of 6 bar (4 bar) in the absence of an air stream. This setting is only correct for a pressure of at least 7 bar (5 bar) upstream of the service unit.

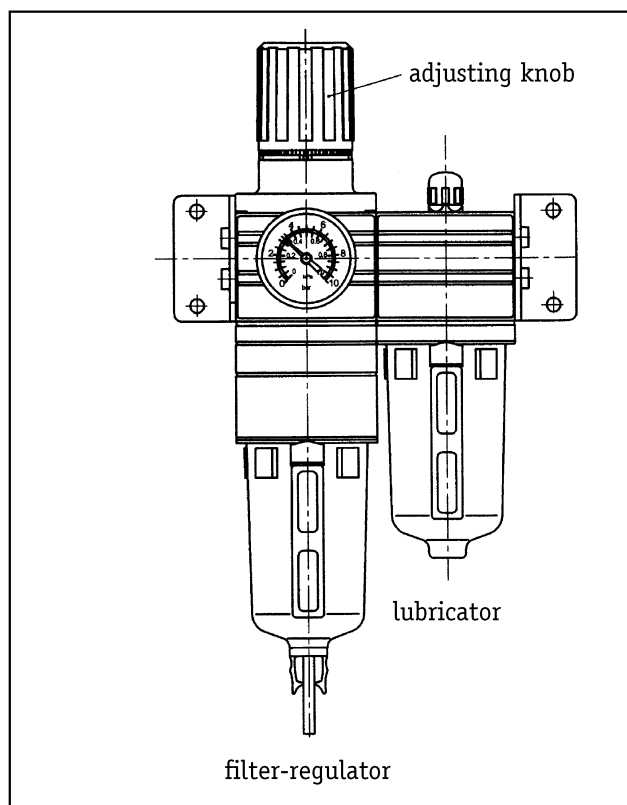
- ▶ Depressurise the air line downstream of the service unit and close it again.
- ▶ Turn the regulator knob anti-clockwise, in order to release the adjusting spring.
- ▶ Turn the regulator knob until the manometer indicates a pressure of 6 bar (4 bar).
Clockwise: higher pressure
Anti-clockwise: lower pressure
- ▶ Lock the regulator knob by pressing it down.

If the nominal pressure of 5.4 bar (3.6 bar) cannot be achieved despite a sufficiently high pressure upstream of the service unit, then the air line cross-section is too small.

*) Values for 4-bar hoists in brackets



Filter regulator and oiler



J.D. NEUHAUS

powered by air

DRAINING WATER

After a certain time, liquid collects in the filter regulator container, which must be regularly drained. For this purpose, proceed as follows:

- ▶ Check the water level through the sight glass in the filter container. The water level must not reach the separating plate.
- ▶ Fit the accompanying hose (instead of this, a $\varnothing 8 \times 1$ soft PVC hose of the required length can be fitted).
- ▶ Collect the escaping water ensure proper disposal, as possibly oil-containing.

CLEANING THE FILTER ELEMENT

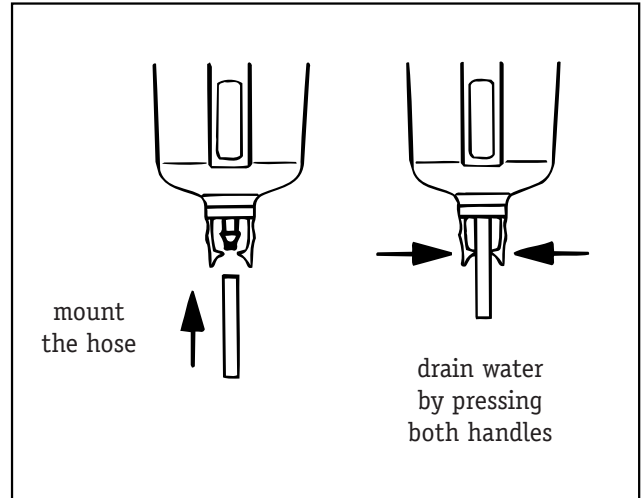


ATTENTION!

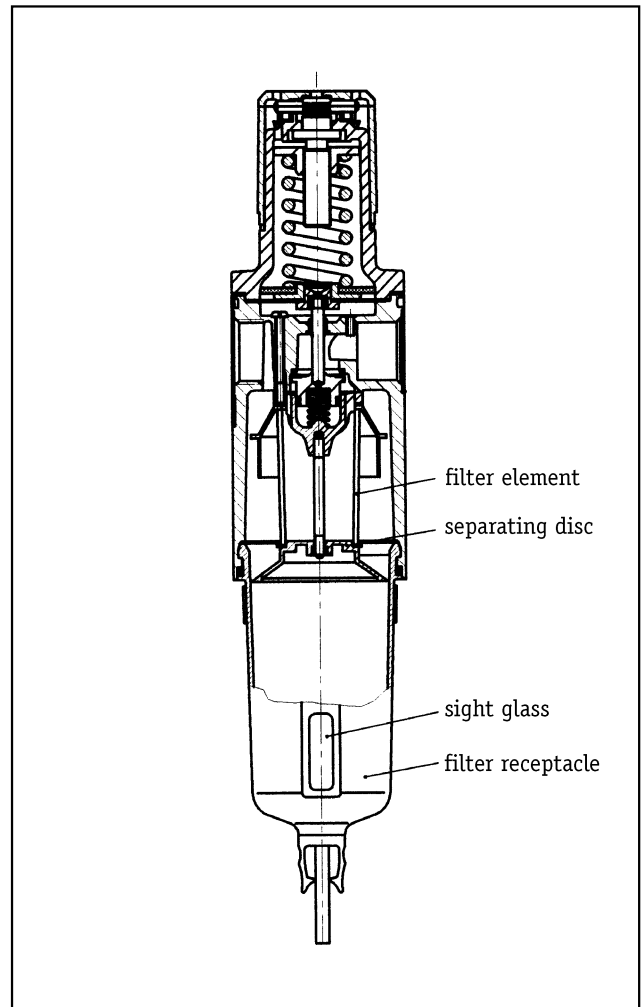
Do not use alcohol for cleaning the service unit. Alcohol can damage parts of service unit. Transparent components must only be cleaned using soap solution.

The filter element must be cleaned once annually. For this purpose, proceed as follows:

- ▶ Drain the water.
- ▶ Shut off the main air supply and carefully allow the residual pressure to dissipate.
- ▶ Unlock the filter regulator container, turn anti-clockwise to the stop and remove.
- ▶ Unscrew the separating plate. The filter is located loosely on the separating plate centring device.
- ▶ Clean the filter element using soap solution and blow through forcefully.
- ▶ Reinstall the clean filter element and fasten the separating plate.
- ▶ Insert the filter regulator container in the housing and turn clockwise. The container locks automatically.



Draining water



Cleaning the filter element

FILLING AND ADJUSTING OILER

The oiler ensures that the hoist air supply is consistently provided with a precisely-metered quantity of oil. Regular checking of the oiler is very important, as the vane motor may be damaged in the case of lubricant deficiency. The oiler can also be refilled under pressure.

- ▶ Check the oil level through the sight glass in the container. The oil level must not fall below the minimum mark.
- ▶ Remove the oil filler screw.
- ▶ Fill the container with oil up to the maximum mark and refit the oil filler screw.
- ▶ Check the oil drop rate at the sight glass with the motor running.
- ▶ Turn the oil throttle screw using a screwdriver until the desired number of drops per minute is achieved. Turning clockwise reduces the amount of oil; turning anti-clockwise increases the amount of oil.

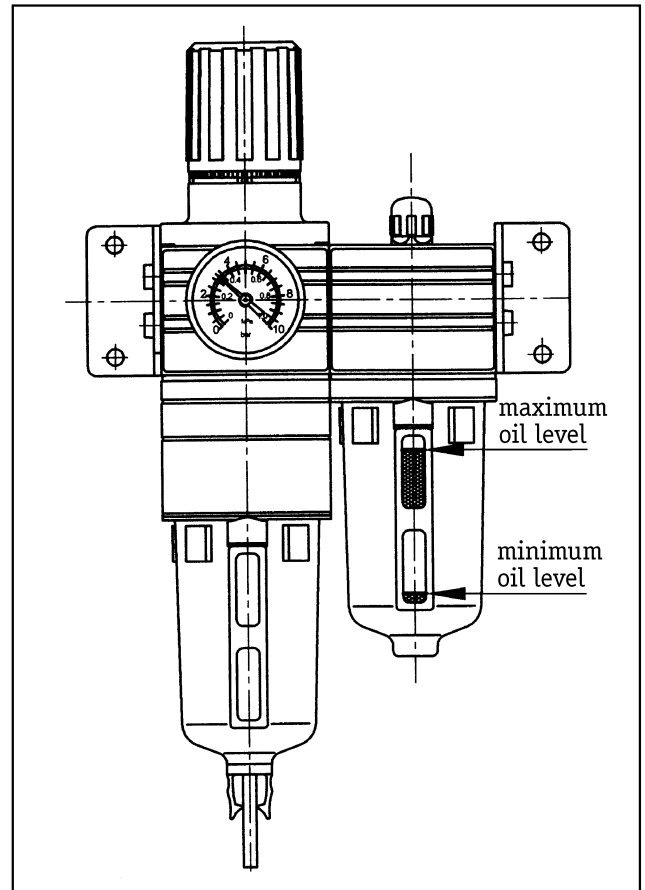
Oil drop rate (lifting without load):

10 drops per minute

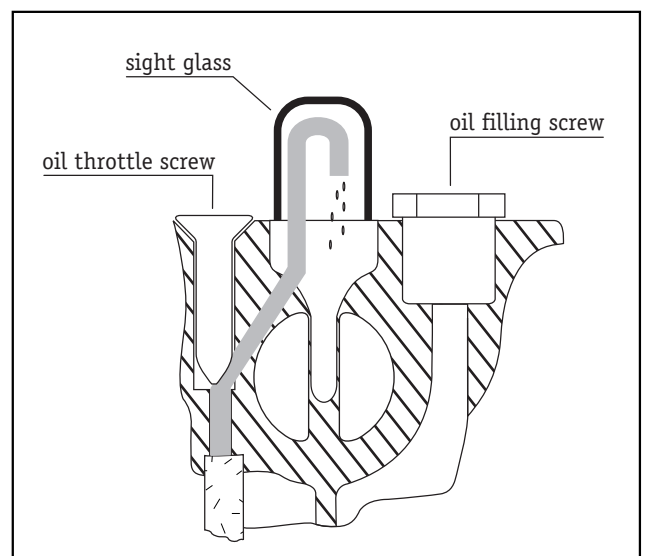


ATTENTION!

Operation of service units with synthetic oils is not permissible. They must also not be connected to compressed air circuits, which are supplied by compressors lubricated with synthetic oil.



Check the oil level and top up if necessary



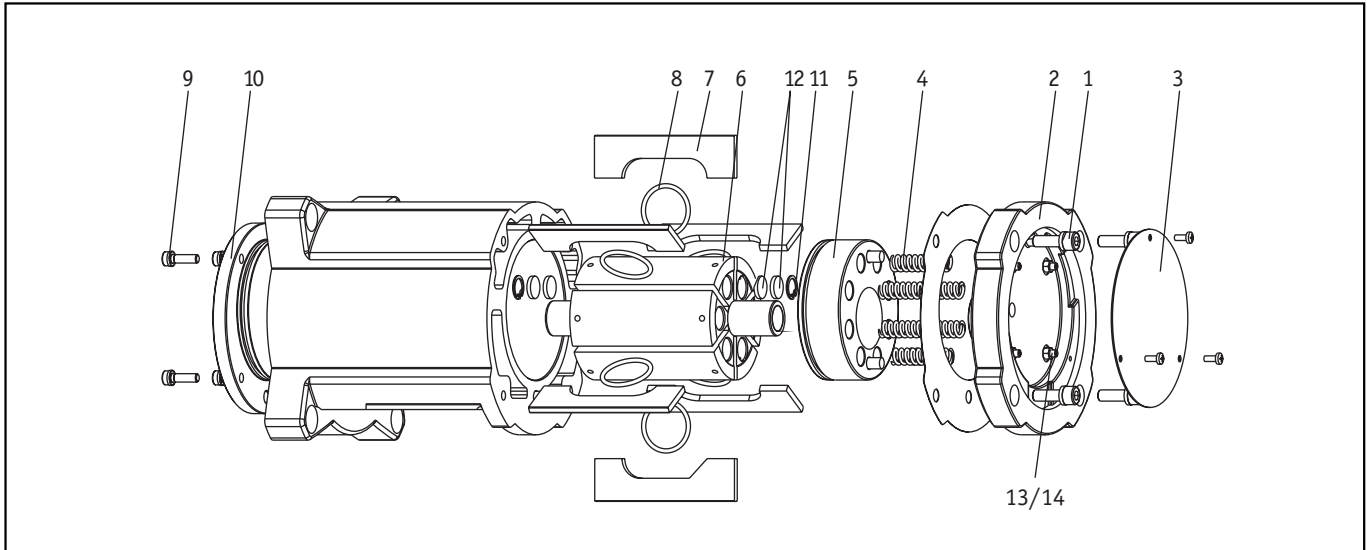
Check oil drop rate at sight glass and adjust



J.D. NEUHAUS

powered by air

REPLACING BRAKE DISC, BRAKE PISTON AND VANES/ MOTOR INSTALLATION/ MOTOR LUBRICATION



Replacing brake disc, brake piston and vanes/Motor installation

The motor and brake functions are achieved in part by means of shared components. 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 second braking surface located on the opposite side by means of a piston on which braking material is bonded.

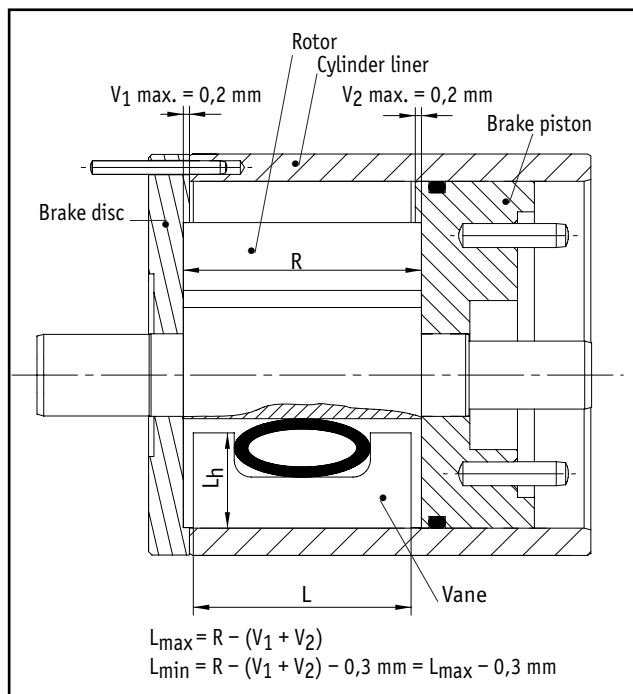
REMOVAL

Proceed as follows when removing the motor with the brake:

- ▶ Disconnect the hoist from the main air supply.
- ▶ Detach the control valve from the motor (in order to permit removal of the motor retaining bolts).
- ▶ Detach the motor from the hoist.
- ▶ Remove the motor cover bolts **1** and remove the motor cover **2** with the nameplate **3**. (When the cover bolts are removed, brake spring tension **4** is fully released).
- ▶ Remove the springs.
- ▶ Remove the brake piston **5** from the internal cylinder integrated in the motor housing.
- ▶ Pull out the rotor **6**, removing the vanes **7** and starting aids **8**.

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

- ▶ Remove the cover bolts **9** and pull out the cover with the brake lining **10**.
- ▶ Check the braking surfaces of the brake piston and the cover with the brake lining for wear and damage, replace if necessary. The circular wear pattern in the braking surfaces 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 43). 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

- ▶ Renewing grease lubrication of motor.
The grease packing in the rotor chambers is sufficient for approx. 250 hours of normal operation.
Note: The rotor chambers only emptied by approx. 60%. In this condition, refilling must be performed. The retaining rings 11 and Vyon washers 12 must be removed in order to refill the chambers. Then fill the lubricant chambers with high-performance lubricant (JDN Art. no 11901) without forming cavities.

Use new Vyon washers to close off the lubricant chambers and secure these using retaining rings.

ASSEMBLY WITH ADDITIONAL BASIC MOTOR LUBRICATION

- ▶ Fit the cover with the brake lining, inserting the anti-twist device (pin). Coat the braking surface and rotor bearing (needle bush) lightly with high-performance grease.
- ▶ Tighten the cover bolts.
- ▶ Coat the internal cylinder of the housing lightly with high-performance grease.
- ▶ Coat the entire rotor lightly with high-performance grease and insert into the front rotor bearing with the clutch side first.

- ▶ Coat the vanes lightly with high-performance grease and insert into the rotor slots with the starting aids.
- ▶ Coat the braking surface and the outer diameter including the brake piston seal lightly with high-performance grease and push the brake piston with the braking surface first into the internal cylinder; note the position of the eccentric bore.
- ▶ Insert the brake springs into the bores of the brake piston.
- ▶ Detach the nameplate from the motor cover.
- ▶ Loosen adjusting bolts 13 and lock nuts 14. Screw back adjusting bolts.
- ▶ Apply high-performance grease lightly to rotor bearing (needle bush) in the motor cover and install motor cover, ensure correct seating of the brake springs and locating pins to motor housing and brake piston.
- ▶ Do not tighten the 4 adjusting bolts after bolting the motor cover in place, only screw them in loosely to the stop in the cover. Screw back the lock nuts sufficiently beforehand.
- ▶ Then screw back the adjusting bolts 45° to 60° from the stop, hold, and lock with the nuts.
- ▶ Screw on the nameplate.
- ▶ Initially fasten the motor, then the control valve to the hoist.



ATTENTION!
Tightening torques, see E-list.



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, regulate the adjusting bolts again.

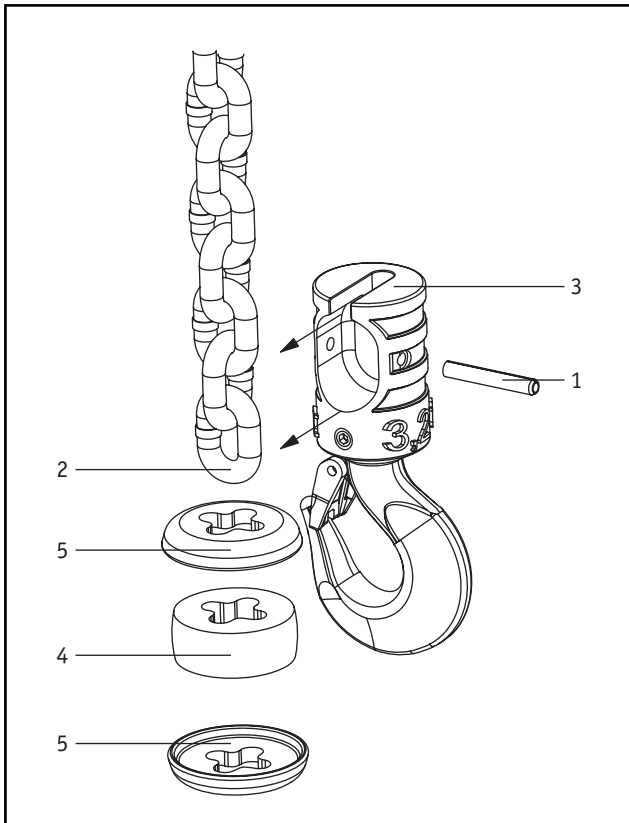


J.D.NEUHAUS

powered by air

REMOVING AND INSTALLING LOAD SLEEVE, BOTTOM BLOCK, CLAMP AND BUFFER

REMOVING AND INSTALLING LOAD SLEEVE AND BUFFER
- SINGLE FALL HOIST (3 TI)



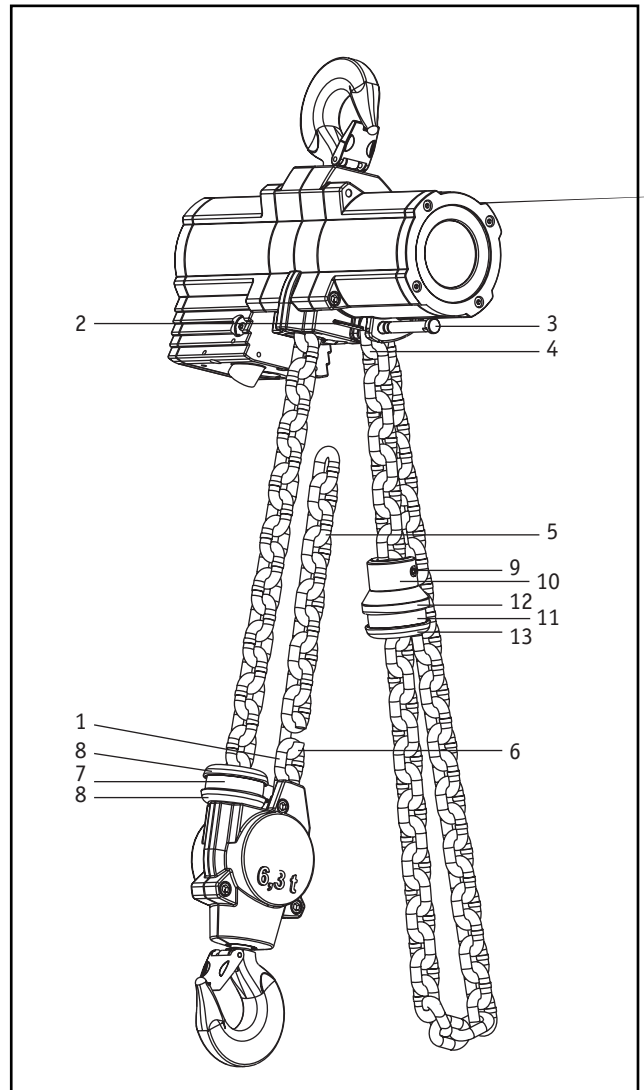
Removal

- ▶ Drive out the roll pin 1 for securing the chain 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 discs (edge encloses buffer) and the buffer onto the chain.
- ▶ Insert the chain link into the chain pocket of the load sleeve (position of the weld must align with that of the following links).
- ▶ Drive in a new roll pin to secure the chain link in the load sleeve.

REMOVING AND INSTALLING BOTTOM BLOCK AND BUFFERS
- DOUBLE FALL HOISTS (6 TI, 10 TI)



Removal

- ▶ Move the bottom block as close as possible to the hoist body.
- ▶ Position the bottom block securely in order to prevent the chain from unravelling uncontrollably causing the bottom block to fall.
- ▶ Remove the chain link 1 of the bottom block from the chain mount on the hoist body by driving out the roll pin 2 and pull out the chain link pin 3 (the end chain link 4 of the idle chain is released simultaneously) or only pull out the chain link pin to the

extent that the end chain link of the idle chain is not released from the hoist body. In versions with chain box, the idle chain is not attached to the hoist body.

Note: For assembly, it is helpful to fasten a short assembly chain 5 to the end of the chain by means of an open chain link 6 before pulling the chain out of the bottom block. This assembly is pulled into the bottom block as the chain is pulled out and remains there until assembly is completed.

- ▶ Pull out the chain from the bottom block. The buffer 7 and buffer discs 8 are thereby pulled from the chain.

Assembly

- ▶ Push the buffer discs (edge encloses buffer) and the buffer onto the chain.
- ▶ Align the chain and fasten it to the assembly chain in the bottom block by means of the open chain link.
- ▶ Pull the chain through the bottom block and detach the assembly chain and the open chain link from the chain.

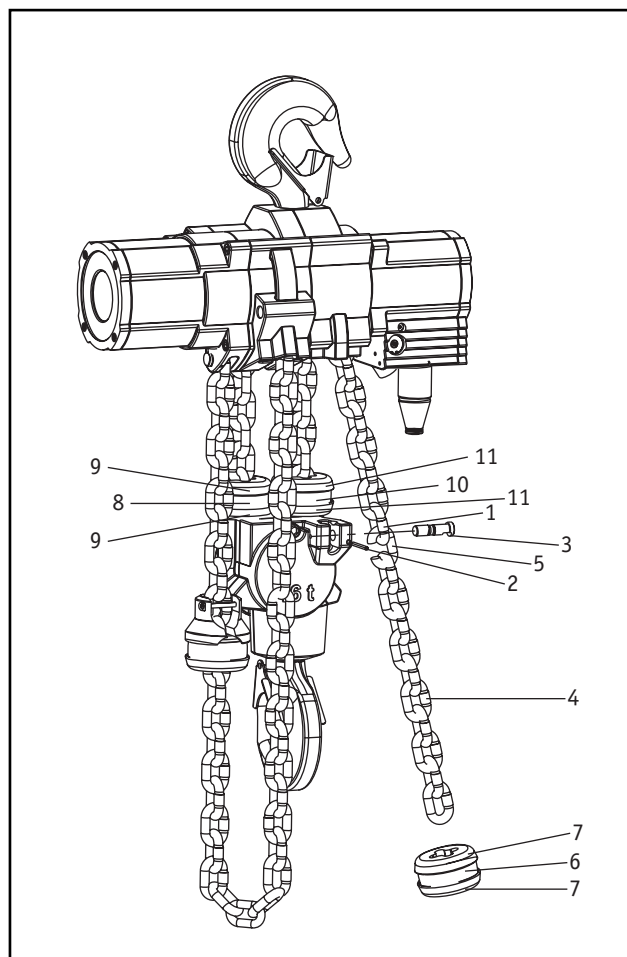
If no assembly chain has been used, the end of the chain must be inserted into the bottom block and pulled through by turning the sprocket wheel using an auxiliary tool.

- ▶ If the chain link pin was not completely pulled out, only align the bottom block chain and push the chain link pin through the chain link to be attached (position of the weld must align with that of the following links).

If the chain link pin was pulled out completely, align the bottom block chain and the idle chain and push the chain link pin into the hoist. It must first be guided through the end link of the idle chain and then through the end link of the bottom block chain (position of the weld must align with that of the following links).

- ▶ Drive in a new roll pin to secure the end link pin.

- TREBLE FALL HOIST (16 TI)



Removal

- ▶ Move the bottom block as close as possible to the hoist body. Position the bottom block securely in order to prevent the chain from unravelling uncontrollably causing the bottom block to fall.
- ▶ Remove the chain link 1 from the chain mount on the bottom block; drive out the roll pin 2 and the end chain link pin 3 for this purpose.

Note: For assembly, it is helpful to work with two short assembly chains 4 which are fastened by means of an open chain link 5 to the hoist chain being pulled out during removal of the chain and are pulled successively over the deflection sprocket of the centre section and the bottom block. They remain there until assembly is completed.



- ▶ Pull the chain from the deflection sprocket of the centre section and from the bottom block. The buffers **6, 8, 10** and buffer discs **7, 9, 11** are thereby pulled from the chain.

Assembly

- ▶ Push the first of the 3 buffer assemblies (buffer **8** plus buffer discs **9**, edge encloses buffer) onto the chain.
- ▶ Align the chain and fasten it to the assembly chain in the bottom block by means of the open chain link.
- ▶ Pull the chain through the bottom block and detach the assembly chain and the open chain link from the chain.
- ▶ Push the second buffer assembly (buffer plus buffer discs) **10, 11** onto the chain.
- ▶ Align the chain and pull through the centre section by means of the assembly chain.
- ▶ Detach the assembly chain and the open chain link from the chain.
- ▶ If no assembly chains have been used, the end of the chain must be inserted into both the bottom block and the centre section and pulled through by turning the deflection sprockets using an auxiliary tool.
- ▶ Push the third buffer assembly (buffer plus buffer discs) **6, 7** onto the chain.
- ▶ Align the chain and fasten the chain link to the bottom block by means of the end link pin (position of the weld must align with that of the following links).
- ▶ Drive in a new roll pin to secure the end link pin.

REMOVING AND INSTALLING CLAMP AND BUFFER

Removal (see illus. page 44)

- ▶ In the case of operation with chain box, run the chain out of the chain box and detach it from the hoist.

Note: In the case of hoists with chain box, the end chain link of the idle chain **4** is not attached to the hoist body.

- ▶ In the case of hoists without chain box, detach the chain link of the idle chain (for double fall hoists, also the end link of the bottom block chain **1**) from the chain mount on the hoist body. Drive out the roll pin **2** and remove the end chain link pin **3**.
- ▶ Immediately fasten the end of the bottom block chain to the hoist body in order to prevent the chain from becoming twisted.
- ▶ Drive out the roll pin **9** from the clamp **10**.

- ▶ Remove the clamp from the chain.
- ▶ Detach the buffer **11** and buffer discs **12 + 13** from the chain.

Assembly

In the case of operation with chain box:

- ▶ Push the buffer disc with edge (edge encloses buffer), buffer and buffer disc without edge onto the chain.
- ▶ Insert the tenth chain link into the chain pocket of the clamp (chain pocket away from hoist body).
- ▶ Drive in a new roll pin to secure the chain link in the clamp.
- ▶ Attach the chain box.

In the case of operation without chain box:

- ▶ Align the chain link of the idle chain (for double fall hoists also the end link of the bottom block chain) and fasten to the hoist body by means of the end chain link pin (position of the weld must align with that of the following links).
- ▶ Drive in a new roll pin to secure the end chain link pin.



ATTENTION!

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

CHECKING CHAIN, CHAIN SPROCKET AND CHAIN GUIDES

See also **Check dimensions**, page 47.

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

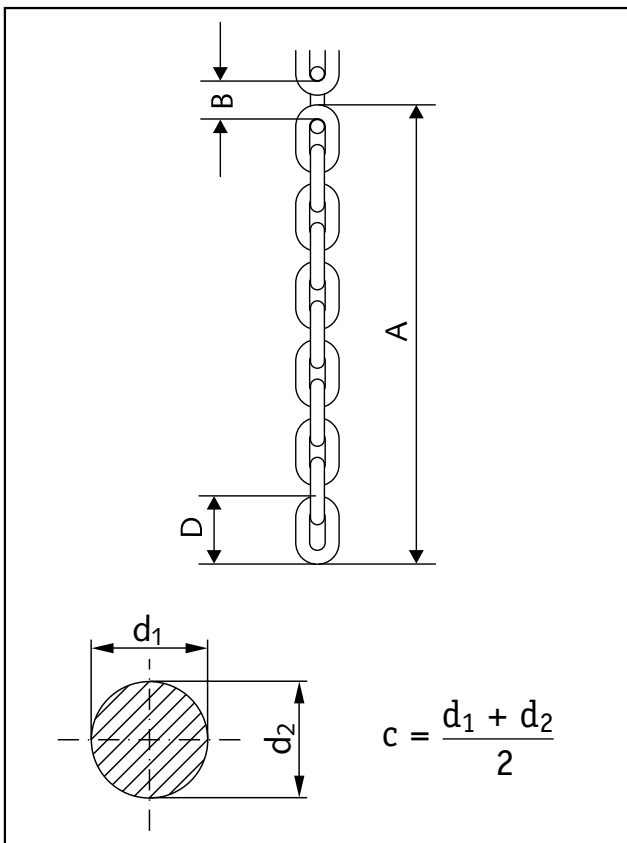
- ▶ Corrosion scars
- ▶ Bent or damaged chain links
- ▶ Chain drawn stiff
- ▶ Wear over 11 pitches (A_{max})
- ▶ Single pitch wear (B_{max})
- ▶ Elongation of a single link (D_{max})

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

CHECK DIMENSIONS

HOIST CHAIN

Note: When checking the replacement limit, future wear to the next checking 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 sprocket must be replaced together with the chain, as the new chain will otherwise be subjected to increased wear. Each chain replacement must be documented in the inspection log.



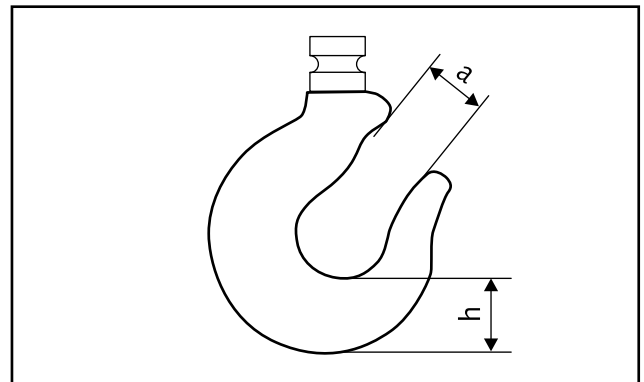
Check dimensions of hoist chain

Chain d x t	13 x 36	16 x 45
Dimension A max.	429.2	536
11 x t inside max.	404.3	505.3
Dimension B max.	37.9	47.4
Dimension C min.	11.7	14.4
Dimension D max.	63.9	79.3

Dimensions in mm

LOAD HOOK

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



Check dimensions of the load hook

Type	Maximum permis. dimension of hook opening "a" ¹⁾	Minimum permis. dimension of height h
Profi 3 TI	35.7	36.1
Profi 6 TI	46.0	44.7
Profi 10 TI	50.4	58.9
Profi 16 TI	60.6	71.3

Dimensions in mm

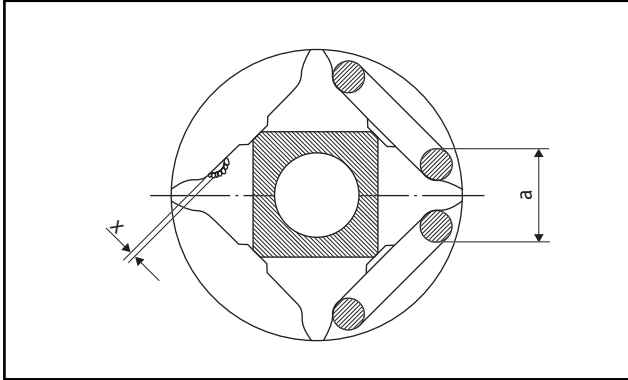
¹⁾ If a safety catch is fitted, the thickness of the safety catch must be subtracted from the maximum hook opening dimension "a".



J.D. NEUHAUS

powered by air

WEAR DIMENSIONS FOR CHAIN SPROCKETS



Wear dimensions for chain sprockets

Chain size d x t mm x mm	z (1)	a mm	x mm
13 x 36	4	32.8	0.25
16 x 45	4	38.5	0.30

a + x = limit dimensions after maximum permissible wear
 z = number of teeth of the chain sprocket
 d x t = nominal diameter times pitch of chain link

WEAR DIMENSIONS FOR CHAIN GUIDES AND HOOK MOUNTS

Check the chain guides for wear and when the following wear dimensions are reached with regard to chain guide diameters or hook mounts in the centre section of the device: Replace the housing:

Chain diameter	13	16
Wear dimension	1.4	1.7

Dimensions in mm

The wear dimension must be measured at the points on the guide surfaces which have been worn down by the chain.

CHECKING AXIAL PLAY

See check dimensions, page 49.

Maintenance and lubrication

Please ensure that load hooks and/or load eye mounts are regularly checked and lubricated, at least once annually. **Especially important:** in areas where wear-promoting conditions such as high ambient temperatures or corrosive substances in the atmosphere are present, or where lubricants may be washed out, **the frequency of maintenance and inspection intervals must always be increased.**

HAZARDS IN THE CASE OF INSUFFICIENT MAINTENANCE/LUBRICATION



DANGER!

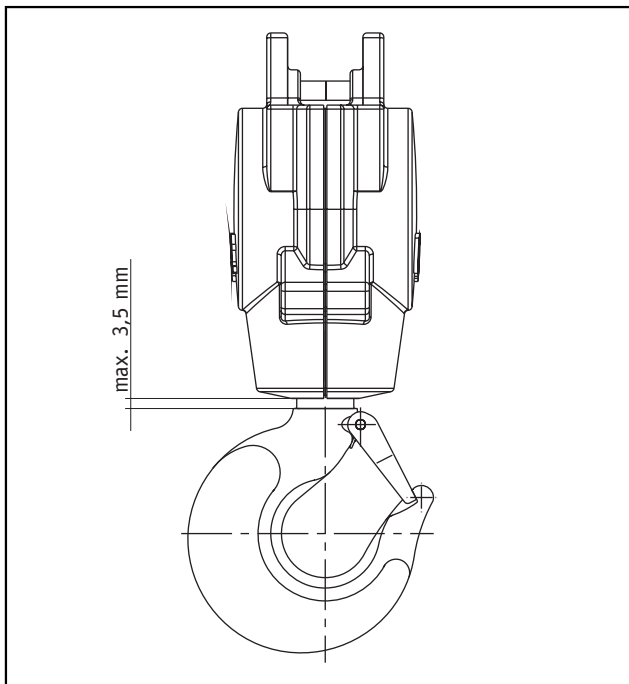
In the event of insufficient maintenance/lubrication the extent of wear may be so high that there is a danger of loads falling.

PREVENTION OF DANGERS

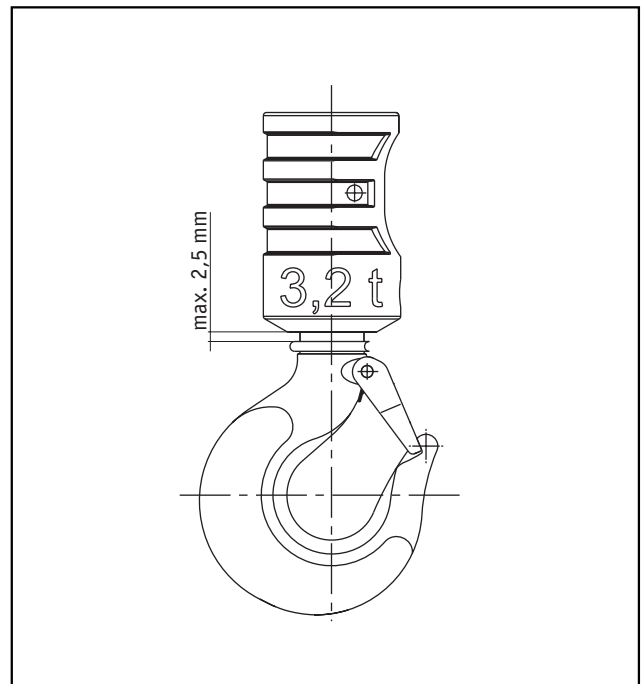
Dangers are avoided by regular maintenance/lubrication in suitable intervals.



When the axial play of the installed hook or load eye exceeds the maximum play specified, the worn parts must be replaced.



Bottom block with load hook or load eye



Load sleeve with load hook or load eye

REMOVING AND INSTALLING 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.

Note: When a chain is replaced, the buffers must also be replaced. For changing buffers at the chain ends, see section **"Removing and installing load sleeve, bottom block, clamp and buffer"**.

The buffers located within the chain are most easily replaced when the open chain link between the old and new chains passes the buffer to be replaced.



ATTENTION!

Do not twist the chain ends.

- ▶ In the case of operation with a chain box: switch the hoist in the "lower" rotational direction and run the old chain out of the chain box. Then remove the chain box.
- ▶ Move the bottom block as close as possible to the hoist body and position it securely.
- ▶ In the case of hoists without chain box, detach the idle chain from the chain mount – for double fall hoists, the bottom block chain is released simultaneously – (see also section **"Removing and installing load sleeve, bottom block, clamp and buffer"**).
- ▶ Detach the clamp, buffer and buffer discs from the end of the idle chain.
For single fall hoists, also detach the load sleeve, buffer and buffer discs from the load chain.
For double fall hoists with chain box, detach the bottom block from the hoist body.
For treble fall hoists, detach the bottom block chain from the mount on the bottom block. (see also section **"Removing and installing load sleeve, bottom block, clamp and buffer"**).

- ▶ Attach the new chain to the end link of the load section of the old chain after aligning the welds and the first chain link by means of an open chain link. The welds on the upright chain links must face outwards when running over the chain sprockets. For this reason, the welds of the chain links which lie flat in the drive sprocket must face towards the gearbox. If the first link of the new chain is not correctly positioned, it must be removed.

Note: It is possible that the first chain link of the other chain end is correctly positioned.

Switch the hoist to the "lift" rotational direction. The new chain will now run into the hoist while the

- ▶ old chain is simultaneously run out on the idle chain side.

Run the chain until the join between the old and new chain has run sufficiently (approx. 1m) out of the centre section on the idle chain side.

- ▶ Detach the connection between the old and new chains.
- ▶ Install the clamp (at the 10th chain link), buffer and buffer discs on the idle chain section of the new chain.

Only in the case of operation without chain box, align the idle chain and attach to the fastening point on the hoist – for double fall hoists, the bottom block chain is also attached here later – (see also section **"Removing and installing load sleeve, bottom block, clamp and buffer"**).

- ▶ Attach the chain box if necessary.
- ▶ Switch the hoist in the "lift" rotational direction until the as yet free end of the **aligned** load chain is the correct length for attaching the chain link,
 - **for single fall hoists** in the load sleeve after the buffer and buffer discs have been pushed on,
 - **for double fall hoists** at the fastening point on the hoist body and
 - **for treble fall hoists** at the fastening point of the bottom block (see also section **"Removing and installing load sleeve, bottom block, clamp and buffer"**).

Note: If the chain link of the load chain is positioned incorrectly, it must be removed, the following chain link will be positioned correctly.



REPLACING CHAIN AND CHAIN SPROCKET

Note: If the chain jams in the hoist and can no longer be run out, the gearbox must be dismantled. The gearbox retaining bolts must be removed for this purpose, and the end chain link pin must be pulled out. The chain wiper must then be removed. The gearbox can now be pulled approx. 15 mm from the centre section. In this position, the safety ring, item 440 (gearbox 3 TI/6 TI), item 500 (gearbox 10 TI/16 TI) see E-list, gearbox) in the vicinity of one of the exhaust air guides. The gearbox housing can then be removed and the gearbox can be dismantled down to the sprocket wheel.

When removing the old chain, assembly chains (1) are brought into position on all the deflection sprockets (see also section "Removing and installing load sleeve, bottom block, clamp and buffer") and section "Removing and installing chain").

Following replacement of the chain sprocket (see spare parts list) an assembly chain (2) is run carefully - with low air pressure - over the drive sprocket.

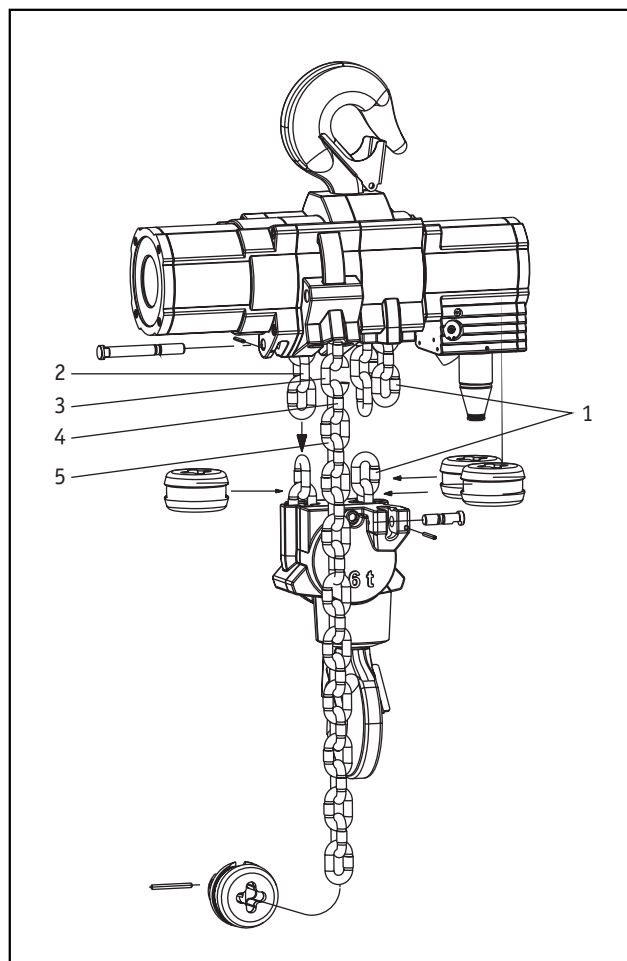
Fasten the new chain to the assembly chain on the drive sprocket by means of one or two open links (3) to the idle chain side. The first chain link (4) must run upright over the drive sprocket with the weld facing outwards. The welds of the chain links which lie flat in the drive sprocket (5) must face towards the gearbox in the case of treble fall hoists. (See illustration).

Switch the hoist to the "lower" rotational direction and detach the assembly chain from the chain after it comes out of the centre section.

Depending on the number of chains of hoist, after alignment, the new chain is pulled over the deflection sprocket of the bottom block and if necessary over the deflection sprocket of the centre section by means of further assembly chains.

Note: If the chain link on the idle chain side is positioned incorrectly, it must be removed, the following chain link will be positioned correctly.

Fastening of the chains and installation of the load sleeve, clamp, buffer and buffer discs is according to section "Removing and installing load sleeve, bottom block, clamp and buffer" and section "Removing and installing chain".



Drawing in the chain



OVERLOAD PROTECTION

The PROFI 3 TI, 6 TI, 10 TI and 16 TI hoists are equipped loads exceeding the limit values set from being lifted. The limit value is set so that loads of 125% of the load carrying capacity cannot be lifted. 110% can be lifted in order to perform the dynamic overload test.



ATTENTION!

The safety clutch must only be engaged for a short time in order to prevent unnecessary wear and overheating of the drive.

When the safety clutch is activated, the hoist should be unloaded by switching to a lowering movement.

The overload protection can also be activated when moving at full unloaded speed against a load to be lifted, even when it is below the load size set. We therefore recommend tensioning the slack chain before lifting the load.

ADJUSTING OVERLOAD PROTECTION

The adjustment method described here is based on the attachment of test loads.



DANGER!

If the overload protection is set too high, impermissibly high stresses may arise if a load exceeding the permissible load carrying capacity is attached.

- ▶ Unload the hoist.
- ▶ Detach the gearbox cover (1) from the gearbox in order to gain access to the threaded pins (2) with lock nuts (3) located behind it.

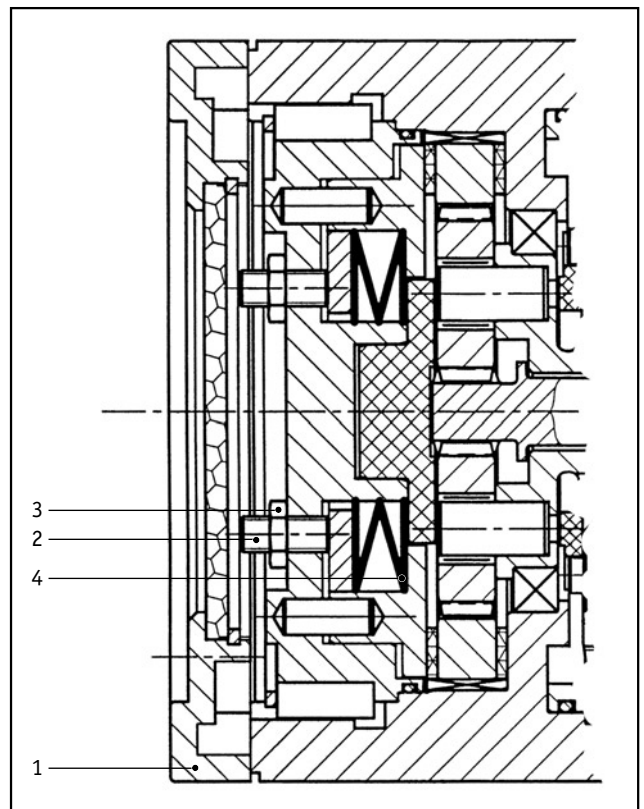
CORRECTING THE LIMIT VALUE SET

- ▶ Loosen the lock nuts. It must be ensured that the threaded pins **are not turned**.
- ▶ During each readjustment, adjust each threaded pin to the same degree in order to adjust the disc springs evenly:
 - turn clockwise – limit value is increased,
 - turn anti-clockwise – limit value is decreased.

- ▶ Secure threaded pins with the lock nuts. Do not turn the threaded pins in the process, as the setting will be altered.
- ▶ Check the limit value for correct setting.
- ▶ Install the gearbox cover.

RESETTING THE LIMIT VALUE

- ▶ Loosen the lock nuts. Screw out the threaded pins – anti-clockwise – until the disc springs (4) are completely free of pre-tension.
- ▶ Then loosely screw in the threaded pins by hand – clockwise – to the stop, screw the lock nuts sufficiently far back beforehand.
- ▶ The limit value for reaching at least 110% of the load-carrying capacity is set at approx. 2 turns. Screw in the three threaded pins successively in small steps by approx. 1/2 turn.
- ▶ Secure threaded pins with the lock nuts. Hold the threaded pins tightly in the process.
- ▶ Check the limit value for correct setting, correct if necessary.
- ▶ Install the gearbox cover.



Gearbox 3.2 t



FAULTS, CAUSE AND REMEDY

FAULT TABLE

Fault	Possible cause	Remedy
Lifting not possible Only very slow lifting is possible	Air pressure too low	Increase air pressure to the relevant value
	EMERGENCY STOP switch is pressed	When the danger has passed, release the EMERGENCY STOP switch
	Hand control is faulty	Have hand control repaired
	Brake does not bleed 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 E-list)
	Brake lining worn	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 falls at higher lifting heights or motor stops	Adjustment of the brake piston too tight	Correct adjustment of the brake piston

*if installed



J.D. NEUHAUS

powered by air

ACCESSORIES

FILTER SILENCER

With the use of a filter silencer, oil aerosols can be avoided and noise insulation improved:

- ▶ 99,9% of oil aerosols during oil lubrication of the motor are absorbed by the filter element.
- ▶ The noise insulation reduces noise levels by 3 to 4 dB (A) compared with the standard silencer (sinter plate).

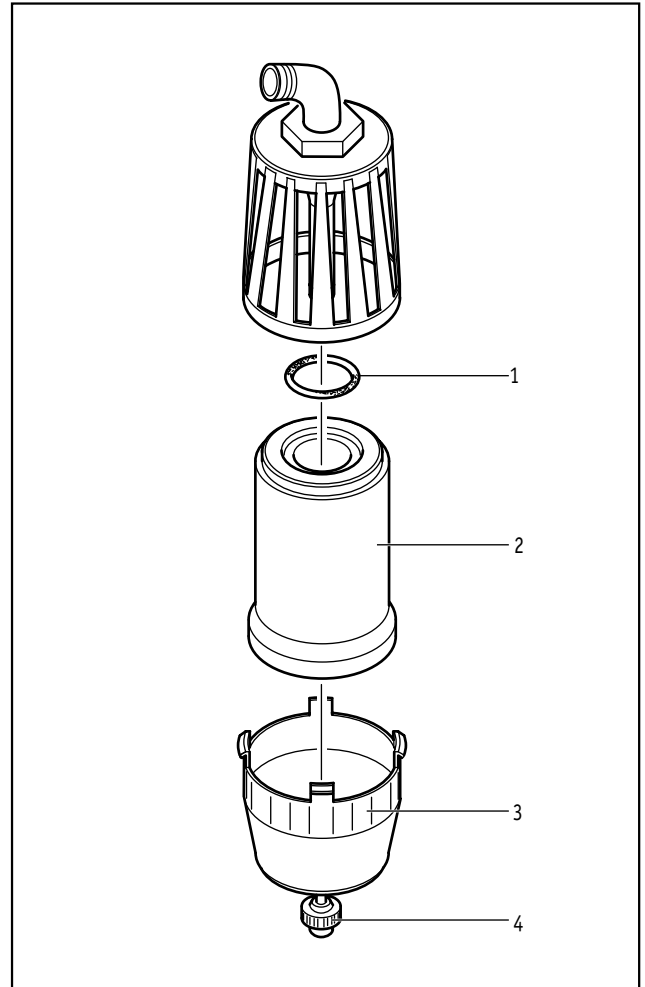
MAINTENANCE OF FILTER SILENCER

The filtered oil runs into the transparent collecting container 3. This container must be emptied before the fluid level reaches the filter element.

- ▶ Turn the drain valve 4 90° and allow the fluid to drain out.
- ▶ Close the drain valve.

The filter must be replaced after approx. 2500 hours of operation.

- ▶ Turn the collecting container 3 slightly and detach.
- ▶ Unscrew the filter element 2.
- ▶ Insert a new filter element, with sealing ring 1 and push on collecting container until it engages.



Filter silencer

BOOSTER UNIT

In the case of a control hose length exceeding 10 m, the reaction times of the lever controls increase significantly.

Consequently, a booster unit is generally installed on the motor for controls E, F and FI, enabling normal reaction times.

CHAIN BOX

For various areas of application, a chain box enhances operational safety, i.e. when a chain which is hanging down could become caught up with the load.

JDN chain boxes are available in various sizes, corresponding to the chain lengths.



ATTENTION!

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



ATTENTION!

Loads must not be moved against the chain box during lifting. If necessary, attach a clamp to the chain.

The clamp must be attached above the load hook so that it functions as a preliminary end stop. With the **PROFI 6 Ti** and **PROFI 10 Ti** (double fall) the clamp must be positioned as far as necessary downwards on the reeved chain in order to support the bottom block (stationary chain).

In addition, a spacer must be attached to the opposite (moving) chain above the buffer in order to relocate the stroke limiter. Please contact us, if required.

For greater clarity, see the lower illustration on page 44.

In all cases, a clamp is attached in the 10th chain link of the unloaded chain end so that a length of chain remains in the chain box when the bottom load hook position is reached. Thus, the chain cannot run next to the chain box during subsequent lifting (see section **Removing and installing chain** page 50).



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.



DANGER!

During operation with the 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.

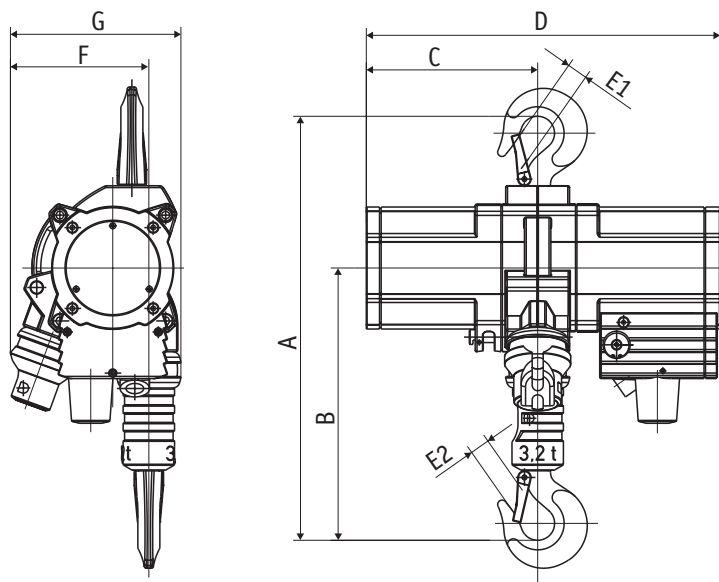
APPENDIX

TECHNICAL DATA

Type		3 TI		6 TI		10 TI		16 TI	
Air pressure	bar	4	6	4	6	4	6	4	6
Load-carrying capacity	t	3.2		6.3		10		16	
Number of chains		1		2		2		3	
Motor power	kW	2	3.5	2	3.5	2	3.5	2	3.5
Lifting speed at nominal load	m/ min	3	5	1.5	2.5	0.8	1.6	0.5	1
Lifting speed without load	m/ min	6	10	3	5	2	3.2	1.2	2
Lowering speed at nominal load	m/ min	6.8	10.8	3.4	5.4	3	3.4	2	2.1
Air consumption at nominal load – Lifting	m ³ /min	2.2	3.2	2.2	3.2	2.2	3.2	2.2	3.2
Air consumption at nominal load – Lowering	m ³ /min	2.8	3.8	2.8	3.8	2.8	3.8	2.8	3.8
Air connection		G ³ /4		G ³ /4		G ³ /4		G ³ /4	
Hose size (inner ⁄ outer ⁄)	mm	19/31		19/31		19/31		19/31	
Weight for standard lifting distance, rope control	kg	86		110		156		240	
Chain dimensions	mm	13 x 36		13 x 36		16 x 45		16 x 45	
Weight per 1 m chain	kg	3.8		3.8		5.8		5.8	
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 ¹ with standard silencer - Lifting	dB (A)	75	78	75	78	75	78	75	78
Noise pressure level at nominal load ¹ with standard silencer - Lowering	dB (A)	81	80	81	80	81	80	81	80

¹ measured from 1 m distance according to DIN 45635 part 20

DIMENSIONS



Type	3 TI	6 TI	10 TI	16 TI
A Minimum headroom	593	674	813	898
B	373	454	548	598
C	233	233	308	382
D	483	483	575	692
E1	40	40	44	53
E2	30	40	44	53
F to centre of hook, without chain box	187	154	197	199
G maximum width	233	233	306	308



J.D. NEUHAUS

powered by air



PROFIT® is a registered trademark of our company.
BA 816 GB á Issue: July 2003 á Alterations reserved á With the issue
of this edition, all previous versions are null and void á 72003

J.D. Neuhaus GmbH & Co. KG_D-58449 Witten-Heven
Phone: +49(0)23 02-2 08-0_Fax: +49(0)23 02-2 08-286
web site: www.jdn.de_e-mail: info@jdn.de



J. D. NEUHAUS

powered by air
powered by air