

JDN OPERATION MANUAL TROLLEYS



J.D. NEUHAUS
powered by air!

This manual, edition 4/2005, covers the operation of the following JDN Trolleys:

- ▶ manual trolleys
- ▶ reel chain trolleys
- ▶ motorised trolleys
- ▶ low headroom trolleys

and for the running gears of the following hoist systems:

- ▶ synchronised hoists
- ▶ lifting and rotating units
- ▶ monorail hoists
- ▶ ultra-low hoists

Before operating any trolley, read the entire manual carefully.

For trolleys with a built-in or suspended hoist, for motorised trolleys and for hoist systems, this manual is only valid together with the operation manual for the respective hoist.

Please enter the Fabr. No. of your JDN trolley here.

Fabr. No.



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Please note:

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

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

and, for air hoists installed in trolleys, additionally with

- ▶ BGV D6 "Accident Prevention Regulations for Cranes"

in the respective currently applicable version.

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

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

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

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

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



SAFETY INSTRUCTIONS

ORGANISATIONAL MEASURES

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

All personnel charged with operating air hoists must have read and understood the operation manual, especially the section entitled "Rules for the safe operation of hoists", before commencing work. This is particularly important for personnel who only occasionally operate the hoist, e.g. for maintenance or retrofitting work.

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

- ▶ keep the operation manuals available at the hoist operating site,
- ▶ carry out regular training,
- ▶ implement an inspection log and make regular entries,
- ▶ regularly check personnel for safety and hazard awareness during work.

PERSONNEL SAFETY

Ensure that only properly trained personnel are entrusted with operation, maintenance, inspection and repair.

"Properly trained" in this case means that the operator has appropriate training and experience in working with hoists and is sufficiently versed in occupational safety and accident prevention regulations to be able to determine whether or not it is safe to operate the hoist.

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

PREVENTING PROPERTY DAMAGE

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

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



PRODUCT INFORMATION

THE OPERATION MANUAL

This operation manual is intended to help the operator to learn about JDN trolleys and how to use them properly.

This operation manual contains important information for the safe, proper and efficient operation of JDN trolleys. By following this information, the risk of a safety hazard, repair costs and machinery downtime can be reduced and the service life of the JDN trolley can be extended.

Always keep the manual readily available at the location where the JDN trolley is being used.

All persons charged with operating, maintaining or repairing JDN trolleys must read and follow the instructions in this manual.

WARNINGS AND SYMBOLS

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



DANGER!

Safety warnings, which if not followed can result in hazard to life and limb, are indicated by this symbol. The symbol indicates an immediate danger. The possible consequences of non-observance may be severe or even fatal injuries.



WARNING!

This symbol indicates potentially hazardous situations. Failure to follow the instructions could result in injuries.



CAUTION!

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

IDENTIFICATION

The nameplate mounted on the side plate identifies the type of JDN trolley and contains important rating data.

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

J.D. NEUHAUS GMBH & CO. KG
 Windenstraße 2-4
 D - 58455 Witten-Heven Germany

Phone +49 23 02/208-0
 Fax +49 23 02/208-286
 www.jdn.de
 e-mail: info@jdn.de

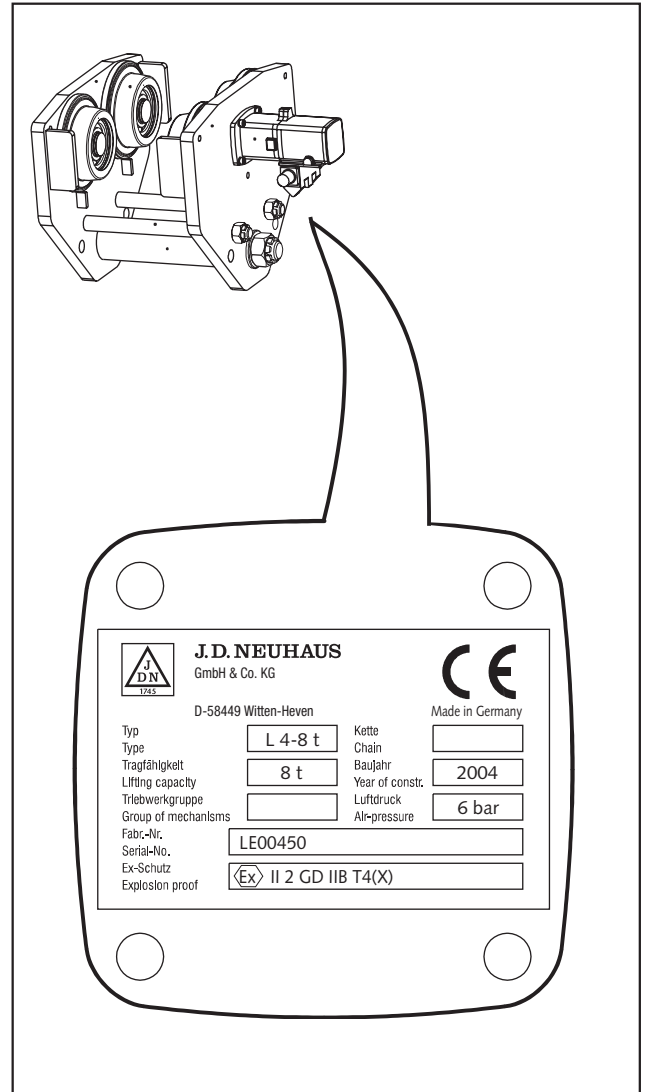


Figure 1: Nameplate



MAIN COMPONENTS

JDN trolleys and running gears consist of the following main components:

- 1 side plates
- 2 rolling wheels
- 3 distance spacers
- 4 load bolts/clevis load bar
- 5 air motor drive, reel chain drive
exemption: no drive with manual trolleys

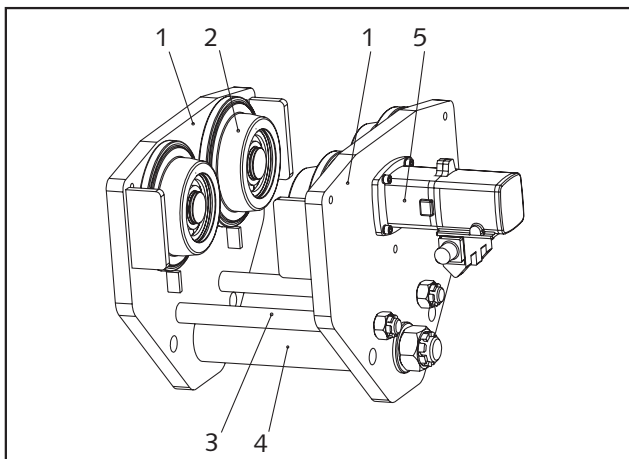


Figure 2: Main components of JDN trolleys (figure shows motorised trolley)

PRODUCT DESCRIPTION

To traverse loads, JDN air hoists can be suspended or built into JDN trolleys.

The air hoist is suspended with its upper hook in the load bolt or load eye of the trolley.

Built-in means that the hoist is rigidly mounted into the trolley by means of a twist-proof load eye.

JDN monorail hoists and low headroom trolleys have this rigid connection only.

JDN trolleys are moved according to their construction:

- ▶ Manual trolleys by pushing or pulling by hand (on hooks and/or load)
- ▶ Reel chain trolleys by alternatively unwinding the reel chain

- ▶ Motorised trolleys by actuating the control of the traversing motor

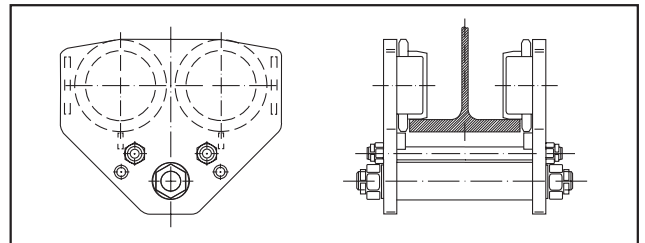


Figure 3: Manual trolley

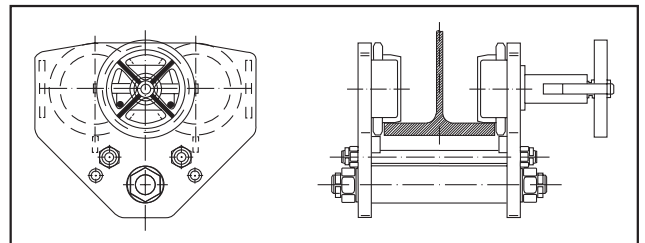


Figure 4: Reel chain trolley

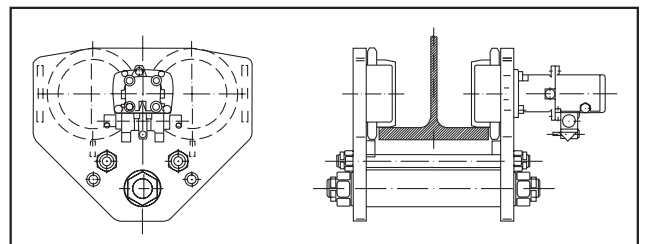


Figure 5: Motorised trolley

The operating pressure of the traversing motors is in accordance with the operating pressure of the corresponding hoist (see nameplate).

JDN trolleys are designed in accordance with DIN 15018 and correspond to stress group B4, lifting group H2. They are suitable for girders according to DIN 1025 or similar types of girder.

The track width of the trolleys above 2 tons carrying capacity is adjusted to the girder profile given by you in the order sheet.

Note: The track width of some JDN trolleys can be adjusted within a certain range. If you want to use your trolley on a girder profile different to the original one, please contact us.

JDN trolleys are fitted with anti-climb and anti-drop devices.

These form-fitting devices are additional safety measures and prevent the trolley from falling down irrespective of the function of the running wheels and from climbing up the girder flange.

The possible curve radius can be seen in the attached technical data sheet.

Special JDN trolley models can be delivered with:

- ▶ extra low height for low headroom trolley
- ▶ rack-and-pinion drive for form-fitting power transmission
- ▶ locking device for fixing in a certain position
- ▶ two travel speeds
- ▶ infinitely variable travel speed
- ▶ pneumatic end switches for limiting the movement
- ▶ increased spark protection (as described below) in case of especially high requirements for explosion protection
- ▶ cleaning of the exhaust air by filter silencers
- ▶ throttle control for reducing the maximum travel speed

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.

BASIC EXPLOSION PROTECTION FOR THE STANDARD VERSIONS (EXCLUDING MINI)

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 or ignition temperatures

above 202° C, provided that no light metal or other impact-sensitive dusts are present.

These devices are designated by:

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

Additional marking "X", see page 10.

JDN HOISTS

WITH INCREASED SPARK PROTECTION

JDN hoists in the "with increased spark protection" version (FS), fulfil further explosion protection requirements. With the exception of carbon disulphide (temperature class T6), they can be used in the presence of all gases in zones 1 and 2 and dusts with glow temperatures above 210° C or ignition temperatures above 202° C in zones 21 and 22, and can be designated with Ⓢ II 2 GD IIC T4(X) for installation in a trolley, depending upon the trolley version (see below), but also with Ⓢ II 2 GD IIB T4(X). 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.

STANDARD JDN TROLLEY AND CRANE RUNNING GEAR

JDN trolleys and cranes can be used in zone 2 with standard running wheels (made of steel or cast metal) with all dusts and the presence of gases up to explosion group IIC. Due to the low running speeds, the possible friction velocities on the running wheels are less than 1 m/s, which means that standard running wheels can also be used in zone 1 up to explosion group IIB. The highest possible designation for these devices is:

Ⓢ II 2 GD IIB T4(X) / II 3 GD IIC T4(X). Depending on the hoist version, designations

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

Ⓢ II 2 GD IIB T4(X) are also used.



JDN TROLLEY AND CRANE RUNNING GEAR WITH INCREASED SPARK PROTECTION

For use in zone 1 in the presence of gases in explosion group IIC, bronzed running wheels or running wheels made of bronze are also used. The highest possible designation for this version (FSR) is II 2 GD IIC T4(X) (the same as for JDN hoists “with increased spark protection”).

JDN TROLLEY AND CRANE RUNNING GEAR FOR USE IN THE PRESENCE OF TEMPERATURE CLASS T6 GASES OR DUSTS

As is the case with JDN hoists “with increased spark protection”, temperature class T6 could also be possible in this case too in the event of a special investigation of applicability, so that the highest possible designation for standard wheels and for bronzed or bronze wheels is $\text{II 2 GD IIB T6(X) / II 3 GD IIC T6(X)}$ and II 2 GD IIC T6(X) respectively, i.e. each including the additional designation “X” for special conditions.

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).

ADDITIONAL MARKING X

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

$\text{II 2 GD IIA T4(X) / II 3 GD IIB T4(X)}$ 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 or ignition temperatures below 202° C. The permissible ambient temperature range (Ta) extends from - 20° C to + 70° C. At carrying capacities above 25 tons, continuous operation of the hoists is not permitted if the ambient temperature exceeds 50° C.

In these cases, cooling times must be observed in order not to exceed the permissible surface temperatures.

II 2 GD IIC T4(X) or II 2 GD IIB T4(X) : The permissible ambient temperature range (Ta) extends from - 20° C to + 70° C. At carrying capacities above 25 tons, continuous operation of the hoists is not permitted if the ambient temperature exceeds 50° C. In these cases, cooling times must be observed in order not to exceed the permissible surface temperatures. ... 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 and which stipulate the maximum surface temperatures for the device.

USE IN MINING APPLICATIONS

Standard versions of JDN hoists, trolleys and crane systems may generally also be used for underground mining operations as well as for the associated surface facilities, which are hazardous due to firedamp and/or combustible dusts. Within this equipment group I they belong to category M2. They constitute devices that can be switched off in cases where an explosive atmosphere forms. They are equipped with protective measures offering a high degree of safety. The protective measures with which products of this category are equipped provide the necessary degree of safety for normal operation as well as operation under difficult conditions, in particular rough treatment and changing environmental influences. For other difficult conditions in addition to explosion protection prevailing with regard to the general handling of the devices in mining applications, special mining hoists are available from J. D. NEUHAUS. The maximum permissible temperature of 150° C in accordance with EN 13463-1⁵ for coal dust atmospheres is not reached. For mining applications, the relevant designation for hoists, trolleys and crane systems is I M2 .



LOAD CHAIN

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

COMPRESSED AIR HOSES

In zone 1, compressed air hoses must have a sufficiently low surface resistance of less than $10^9 \Omega$ in order to prevent electrostatic ignition hazards. Otherwise (resistance $>10^9 \Omega$), for explosion groups I, IIA and IIB the hoses must be $\varnothing \leq 30$ mm and for explosion group iic $\varnothing \leq 20$ mm, or proof must be provided that they cannot become dangerously charged.

MATERIALS FOR FRICTION AND IMPACT HAZARDS

Friction and impacts can give rise to individual sparks presenting a danger of ignition in the presence of explosion group IIC gases, hydrogen sulphide, ethylene oxide, or light-metal or other impact-sensitive dusts. Accordingly, spark formation caused by mechanical influences must be prevented. The chain and load must always be moved in such a way that sliding and/or frictional contact with other plants or components is excluded. If circumstances do not permit this, it is necessary to ensure an absence of explosive atmospheres during operation.

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

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**).

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

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 an aqueous phase, which is capable of reacting with acetylene and which can result in an explosion hazard.



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

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

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

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

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

- A: The chain is made of zinc-plated steel; metal controls are conductively connected to the hoist. This is part of the standard equipment. For technological reasons, a zinc-plated version of chain size 31.5 x 90 is not available. This is only used for the extremely slow-running chain drives of large hoists, so that the sliding velocity for potential friction points between the chain and the surroundings remains well below 1 m/s.
- FS: Hoists "with increased spark protection": Copper-plated load hook and bottom flange 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 (operator's responsibility):**

- D** : Ignition hazards are not to be expected if hoists or cranes are used in the normal manner. Friction and impacts in the working area of the chain, not resulting from intended use of the hoist or crane and which result in sparking, must be excluded, or an absence of gas in the operating area must be ensured. This means, for example, that the chain, the bottom flange and the load hook must be prevented from swinging against surrounding objects or that a gas-free environment must be ensured.
- E** : Friction, impact and sliding points involving combinations of light metal and steel or cast iron must not be present in the hoist's operating area.
- T** : Ambient temperature and the type of operation must be examined separately.



**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 75K. Greater safety margins are required if the thickness of the dust layer exceeds 5 mm.

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

Synthetic rubber, soot-containing:
Glow temperature $220^{\circ}\text{C} - 75^{\circ}\text{C} = 145^{\circ}\text{C}$ max.
permissible surface
temperature

Stearic acid:
Ignition temperature $190^{\circ}\text{C} \times 2/3 = 126^{\circ}\text{C}$ max.
permissible surface
temperature

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

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



INTENDED USE

JDN trolleys in combination with JDN air hoists are intended to be used exclusively for lifting and lowering loads and for their horizontal movement above floor.

Any other use or use outside these stipulations is deemed to be impermissible. J.D. NEUHAUS GMBH & Co. KG cannot be held liable for any resultant damage. The entire risk is borne by the operator.

Improper use includes, but is not limited to, any and all of the following:

- ▶ Exceeding the permitted load-carrying capacity
- ▶ Oblique pulling of loads
- ▶ Sliding loads
- ▶ Detaching, dragging or pulling of loads
- ▶ Catching of falling loads
- ▶ Carrying people
- ▶ Jog control over longer distances
- ▶ Switching to the opposite direction with load in motion
- ▶ Operational reaching of the end stop

See also **Rules for the safe operation of trolleys**, page 28.

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

EMISSIONS

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

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

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

Oil emissions can be prevented by using a filter silencer (see **Filter silencer** section, page 38). This also results in a reduction of the noise emission values.

OPERATING CONDITIONS

JDN air hoists are extremely robust and require little maintenance. They are suitable for use in explosion-hazardous areas, as well as in areas with increased concentrations of soot and dust, high humidity and at ambient temperatures of -20°C up to approx. $+70^{\circ}\text{C}$ if they are not heated above this level due to external influences. The thermal endurance of chains and hooks is $+150^{\circ}\text{C}$.



WARNING!

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

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

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

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



DANGER!

Warning against excessive system pressures

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



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

- ▶ Particle size less than 40 µm
- ▶ Particle density less than 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.

See also **Lubricants**, page 25.

- ▶ 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

- ▶ using 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),
- ▶ using compressed air oil (Art. no. 11900) with anti-icing agent for relevant temperatures.

ENERGY REQUIREMENTS

For air pressure, air quantity and connections, see the table **Technical data**, page 43.

AIR PRESSURE CONDITIONS IN OPERATION

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

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

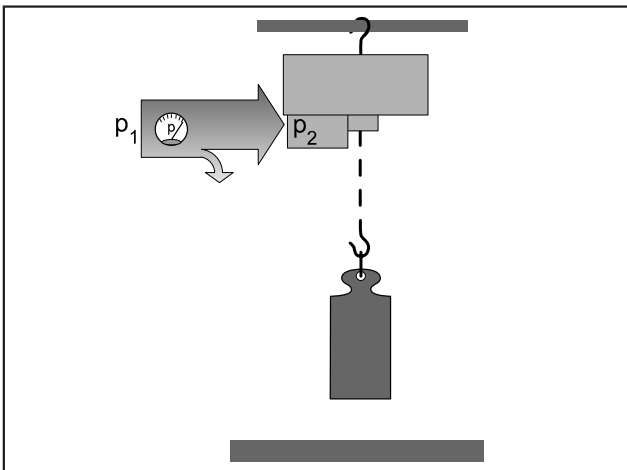
The value of the actual pressure p_2 at which the hoist is operated depends upon

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

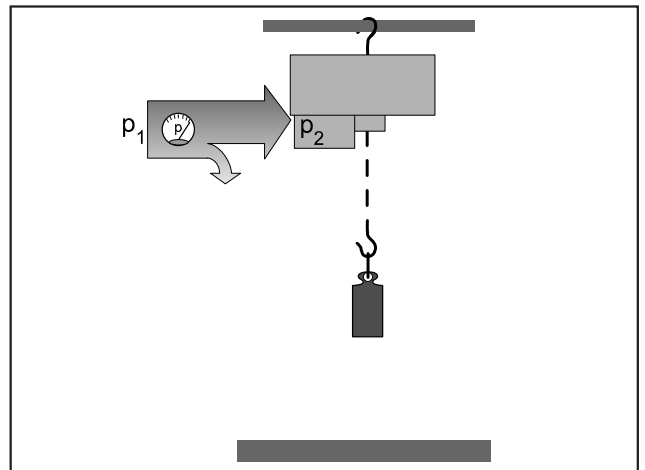
When lifting the nominal load (load-carrying capacity), the actual pressure p_2 must not fall below a value of 10% below the specified nominal pressure of the hoist.

Example:

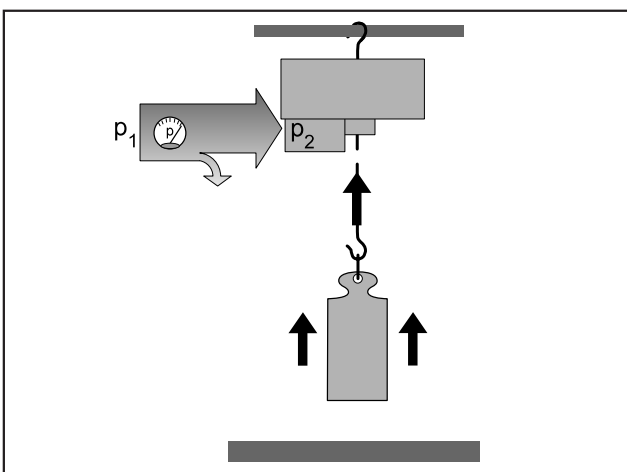
A hoist with a nominal pressure of 6 bar lifts its nominal load at the specified lifting speed, at an actual pressure of 5.4 bar.



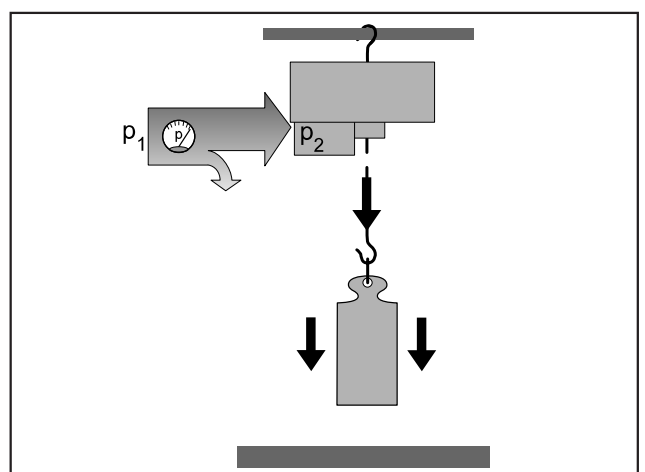
The value of the actual pressure depends upon ...



... the weight of the load ...



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



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

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

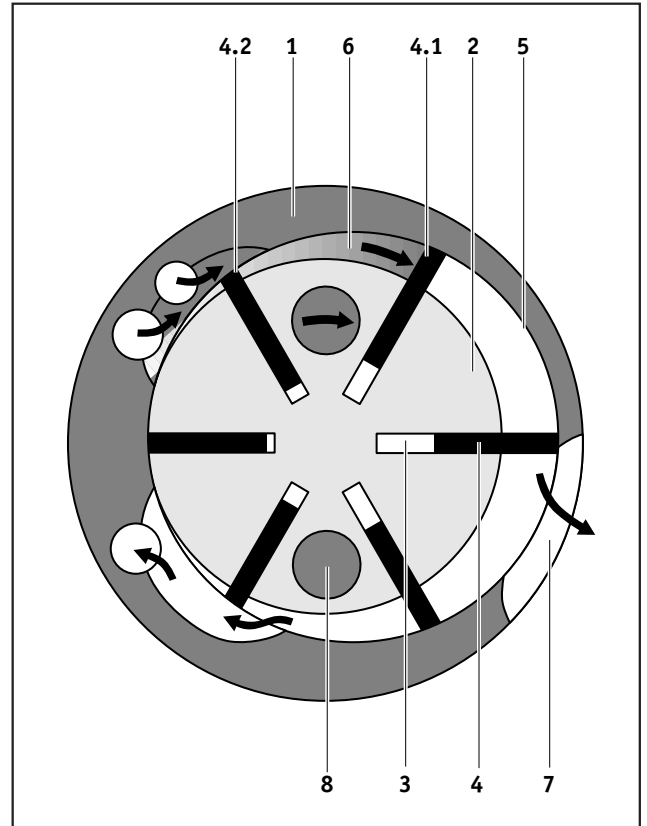
The rotor is mounted eccentrically in the cylinder liner and is provided with slots (3) for installation of the vanes (4).

The vanes can move freely and make contact with the inner wall (5) of the cylinder liner. Each chamber 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.

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 must be renewed when required, but every 5 years at the latest. Therefore, the service unit for filtration and pressure regulation of the compressed air can be installed without an oiler. If required, the service unit is also available with an oiler. Synthetic lubricants must not be used when operating with a service unit. Alcohols are not permitted for use as anti-icing agents.

CE CERTIFICATION/MANUFACTURER'S DECLARATION

Trolleys without hoists will be delivered with a manufacturer's declaration. CE certification can only be given after finishing the complete installation (see the section entitled **Pre-start checks**, page 26).



TRANSPORT AND STORAGE

SAFE TRANSPORTATION

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

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

STORAGE CONDITIONS

BREAKS IN OPERATION

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

STORAGE

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



SETTING UP

UNPACKING



WARNING!

When unpacking, take account of the weight of the hoist. See **Technical data** in the operation manual for the respective hoist.



CAUTION!

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.
- ▶ Recycle packaging materials in accordance with local regulations.

ASSEMBLY

As far as possible, JDN trolleys are delivered in fully assembled condition. If necessary, the filter silencer, chain box and/or control valves are supplied separately and have to be mounted on-site (see the section entitled **Connecting the controls**, page 24).

MOUNTING THE TROLLEY



DANGER!

JDN trolleys must only be installed by qualified personnel. An incorrect installation can lead to serious injuries.



WARNING!

The trolley girders for JDN trolleys must be able to safely withstand the expected forces. Reel chain and motorised trolleys for 3.2 tons carrying capacity have two anti-tipping devices at their rear side plates. These have to be loosened and pushed downwards in the elongated hole before mounting. After mounting they have to be put back in the original position.

The calculation of the static and the selection of the girder profile are the responsibility of the operator. The carrying capacity of the suspended/built-in hoist must not be bigger than the capacity of the trolley.

Dynamic tractive forces have to be considered.

JDN trolleys are designed for running girder profiles in accordance with DIN 1025 or similar profiles.

There must be sufficient room for the trolley to move freely along the whole of the track. For example there should be no screw heads, clamping plates, web plates or other similar items in the way. Please bear in mind that the side plates of our trolleys could extend over the upper edge of the girder, especially if the girder is particularly small. If this is the case, the girders must be suspended or mounted so that they are self-supporting in order not to interfere with the movement of the trolley.

Unhindered movement of the attached energy supply system must be ensured along the trolley's path.

Please supply adequate working tools.

Please look for a safe place for the mounting personnel.

The control hoses on the motor side leading to the control valve should only be connected after having mounted the trolley in order to avoid damage (see the section **Connecting the control hoses**, page 24).



MOUNTING MOTORISED TROLLEYS (LM), REEL CHAIN TROLLEYS (LH) AND MANUAL TROLLEYS (LN) WITH CLEVIS LOAD BAR (UP TO 2 TONS CARRYING CAPACITY)

Screw the clevis load bar with the end marked with an "L" (left-handed thread) approx. 3 mm into the side plate also marked with "L" in the case of LN (for LM and LH, use the one with motor or reel chain drive (front plate)). Screw the second side plate without motor (rear plate) approx. 3 mm onto the other end of the clevis load bar as well. Following this, the clevis load bar is turned further into the side plates until both ends are visible at the outer sides of the side plates.

MOUNTING TROLLEYS WITH CLEVIS LOAD BAR INTO GIRDERS WITH OPEN ENDS

By screwing in the clevis load bar, both side plates are brought to a distance that is approx. 28 mm larger than the bottom flange width of the girder for manual trolleys and approx. 36 mm larger for motorised and reel chain trolleys.

The running gear can now be mounted into the track girder by pushing the running gear onto the girder so that the running wheels roll on the bottom flange. After mounting, the clearance between the outer edge of the bottom flange of the girder and the wheel flange must be between 1 and 1.5 mm on either side.

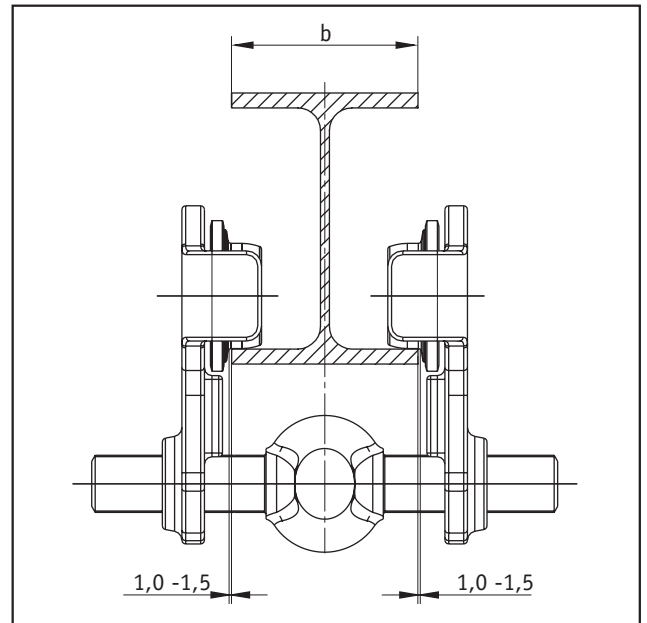


Figure 6: Correct position of clevis load bar and clearance of wheel flanges



DANGER!

At the largest girder width, the clevis load bar must be at least flush with both side plates on the outside.

MOUNTING TROLLEYS WITH CLEVIS LOAD BAR INTO GIRDERS WITH CLOSED ENDS

By turning the clevis load bar, a preadjustment takes place to mount the trolley onto the bottom flange of the girder. The trolley is first pushed onto one end with two wheels and then adjusted by turning the clevis load bar so that the opposite wheels are also placed on the bottom flange. After mounting the trolley, the clearance between the outside edge of the bottom flange of the girder and the wheel flange should be set to between 1 and 1.5 mm on either side.



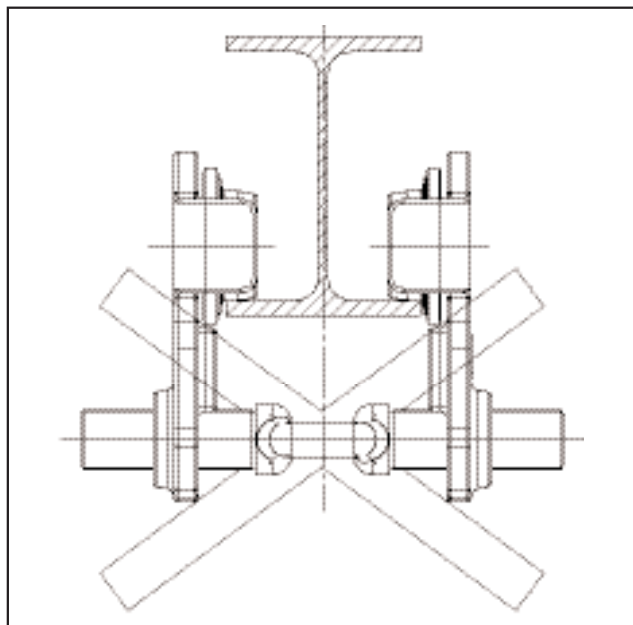


Figure 7: Incorrect position of the clevis load bar



DANGER!

Incorrect suspension/loading of the load bar, i.e. over the flat cross-section, causes danger of fracture and is therefore not permissible.

Correct:

After the running gear width has been adjusted, the clevis of the load bar must be positioned to the girder as shown in figure 6. The load hook of the lifting equipment can now be attached to the clevis.



DANGER!

Do not drop lifting equipment; equipment should always be placed properly onto the floor.

Optional:

Anti-twist device for clevis load bar (for motorised and reel chain trolleys up to 2 tons and 2-ton manual trolleys)

In order to prevent twisting of the side plates on the clevis load bar when mounting and removing the trolleys, the clevis load bar can be counterheld by means of two nuts with threadlocking. After the side plates of the trolley have been adjusted on the relevant girder, a nut with threadlocking is screwed on each side from the

outside against the side plates on the clevis load bar. These are screwed against the side plate and tightened to a torque of 100 Nm (corresponds to hand tightening with a force of 30 kg with a spanner length of 33 cm).

MOUNTING TROLLEYS WITH LOAD BOLT (OVER 2 TONS CARRYING CAPACITY) INTO GIRDERS WITH OPEN ENDS

- ▶ Mount the trolley at one open end of the girder.
- ▶ Secure both ends of the girder with end stops to prevent the trolley from falling. They must be designed for the impact load occurring in the event of a collision, with full load and full speed.
- ▶ The end stops have to be equipped with a buffer. We recommend our clamping buffers.

MOUNTING TROLLEYS WITH LOAD BOLT INTO GIRDERS WITH CLOSED ENDS

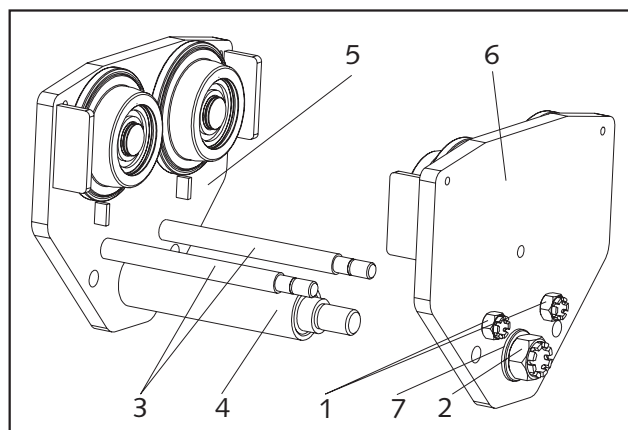


Figure 8: Mounting into girders with closed ends

- ▶ The hexagonal nuts (1,2) of the distance spacers (3) and the load bolt (4) at the rear side plate (6) have to be loosened so far that the trolley can be pushed over the bottom flange of the girder. If necessary, the rear side plate including the outer distance washers (7) have to be completely dismantled.
- ▶ In the case of running gears without distance spacers, the retaining rings must first be removed from the hexagonal nuts (2) of the load bolts and the hexagonal nuts (2) at the rear side section must be loosened so far that the trolley can be pushed over the bottom flange of the girder. If necessary, the rear side plate must be completely dismantled.



- ▶ Position the trolley (possibly including the hoist) with the running wheels of the front side plate on the bottom flange of the girder.
- ▶ Thread on and tighten the rear side plate using washer sets (see the section **Screw retainers and torques**, page 41).



CAUTION!

Please pay attention to the position and number of the locking rings and distance washers.

- ▶ Connecting the controls (see the section **Connecting the controls**, page 24).

After mounting please check

- ▶ the clearance between the outer edge of the girder flange and the wheel flange. It should be between 2 and 3 mm on either side.
- ▶ the position of the anti-tipping device on the rear plate. It should have a clearance of approx. 1 mm to the underside of the girder.
- ▶ the fit and position of the end stops.

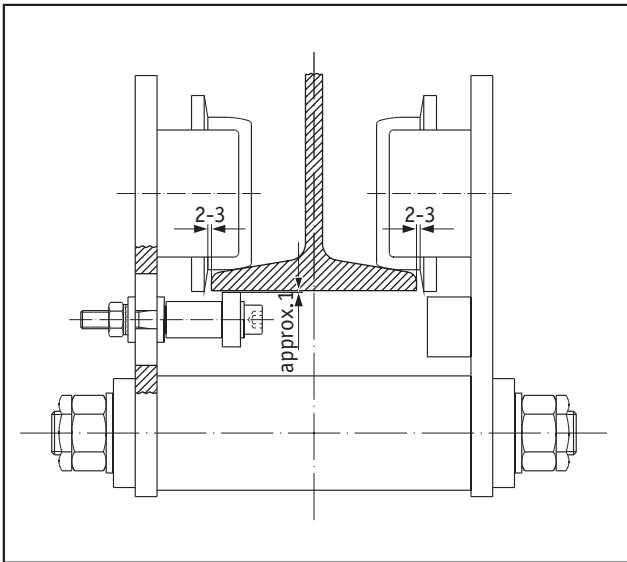


Figure 9: Clearance for the wheel flanges and anti-tipping device

CONNECTING THE CONTROLS

CONNECTING THE CONTROL HOSES

In case the control device is delivered separately, for your guidance short hose pieces have been put into the plug-in connections at the factory. Their colour or numbering corresponds to that of the hoses to be connected, enabling you to connect the hoses one after the other.

REMOVING THE HOSE PIECES

- ▶ Press down the locking ring (1) with a suitable tool (for example screwdriver), pulling out the hose piece (2) at the same time.

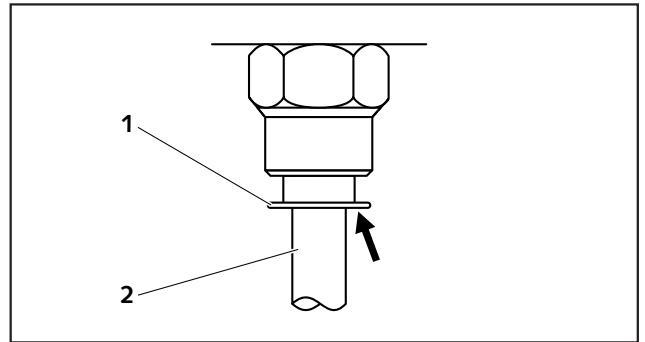


Figure 10: Plug-in connection

MAKING CONNECTIONS

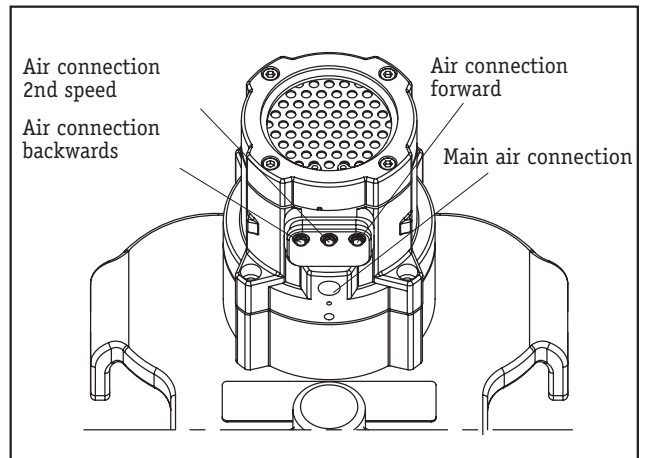


Figure 11: Motor side of the motorise trolleys



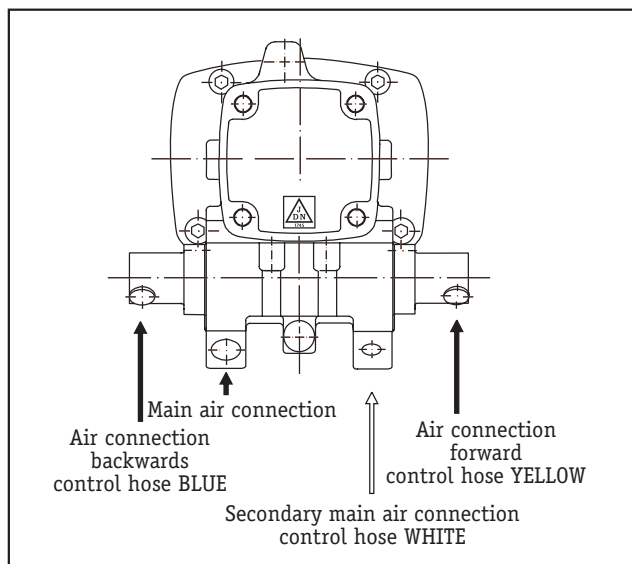


Figure 12: Motor side of the motorise trolleys



CAUTION!

Please ensure that the hose is not bent when inserted.

- ▶ Put the loop of the strain relief (wire rope) into the existing eye bolt.
- ▶ Put the end of the corresponding hose into the hole of the corresponding plug-in connection.
- ▶ Push the hose in as far as the stop.
- ▶ Check the connection by pulling on the hose.

If air escapes from the connection during operation, try to push the hose concerned even further in.

CONNECTING TO THE MAIN AIR SUPPLY

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

LUBRICANTS

The following lubricants are intended for normal environmental influences. If the trolley is operated under adverse conditions that induce increased wear, consult J.D. NEUHAUS for further information.



WARNING!

Oil and grease can cause skin irritation. Wear protective gloves at all times.



CAUTION!

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

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

Synthetic lubricants must not be used when operating with oilers. Alcohols are not permitted for use as anti-icing agents.



Application	Lubricant
Motor lubrication - Applied in the factory - Operation with oiler	- JDN high-performance grease, article no. 11901 (1 kg) article no. 11902 (40 g) - Air motor oil type "D", kinematic viscosity approx. 30 mm ² /s (cSt) at 40° C, anti-icing additive if required
Chain lubrication	Chain oil or motor vehicle engine oil, kinematic viscosity approx. 150 mm ² /s (cSt) at 40° C, or special lubricant from J.D. NEUHAUS In areas with very high corrosion potential, e.g. offshore, a lubricant with extremely strong anti-corrosion properties must be used.
Motor preservation (not applicable when using JDN high-performance grease)	Non-resinous protective oil rated for the duration of the storage period
Motor cleaning (not applicable when using JDN high-performance grease)	Pure petroleum
Lubrication of bearings and gearboxes (also for exposed gears)	Saponified lithium grease, felting penetration 265-295 (0.1 mm), ground oil viscosity: 190 cSt (mm ² /s) at 40° C, dripping point: 180° C, operating temperatures: - 20° C to + 120° C, designation according to DIN 51825: KP2K-20, active agents: corrosion protection

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

STARTING OPERATION

If the trolley is operating with a hoist, the operation manual of the mounted hoist/monorail hoist has to be observed before putting into operation (see also the section **Pre-start checks**, page 26).

INSPECTION

The inspections must be organised by the operator. The persons selected to carry out the inspections must comply with the relevant requirements, which are specified in the national safety regulations. The operator must provide all the documentation and assistance needed for the inspection.

The results of the inspection must be recorded in the inspection log.

PRE-START CHECKS

Hoists mounted into trolleys have to comply with the regulations for the prevention of accidents valid for cranes. Before beginning to use a crane for the first time and after any major modification before starting to work with it again, it has to be checked by a qualified person. See also ZH1/27 "Principles for the Testing of Cranes".

The test has to include the orderly erection, equipment and the readiness of service. The suitability of operation of the ready-to-operate equipment has to be safeguarded:

- ▶ by a dynamic test with 1.1 times the maximum carrying capacity under normal working conditions (lift load just above floor),
- ▶ if necessary by a static test with 1.25 times the maximum carrying capacity (with motorised equipment).

Note: The static test is not applicable for hand-operated cranes.



During these tests, no permanent deformation (distortion), disturbances of performance or other failures may occur.

As according to ZH 1/27, hoists delivered in trolleys do not represent a ready-to-use installation; the manufacturer only supplies a manufacturer's declaration. EC conformity cannot be issued until the ready-to-operate installation has been checked by an authorised person. See the section **CE certification**, page 19.

If necessary, further tests on the basis of national regulations have to be executed. In case of testing loads higher than those mentioned in this manual, please contact J.D. NEUHAUS.

If the control circuit of the installation allows several movements at the same time, the dynamic test has to be executed with combined movements.

For trolleys with rack-and-pinion drives, sufficient flank clearance (approx. 0.3 mm) must be set between the drive pinion and the rack, along the entire track. If the setting is too close, the drive pinion could be damaged or even break.

REGULAR INSPECTION

See the section **Inspection and maintenance work**, page 31.



OPERATION

RULES FOR THE SAFE OPERATION OF TROLLEYS

In addition to the rules listed in the operation manual for JDN air hoists and JDN monorail hoists, the following rules have to be observed:

If several trolleys are working together, the customer has to set up the conditions for safe operation.

If the local conditions or the work to be performed make it necessary, the customer has to define operating instructions.

Maintenance and inspection work may only be performed once the people in charge are convinced that the trolley and the hoist/monorail hoist are cut off from the energy supply and that measures have been taken to prevent the accidental supply of energy.

The same applies to maintenance work and any changes in case personnel in the working area of the trolley may be exposed to danger. If there is a danger that parts may fall down, the corresponding area has to be barricaded and protected by guards. Other risks from neighbouring installations also have to be safeguarded against. Following completion of the work, operation may only recommence after release by the operator. Before release, the operator has to be convinced that all work has finally been completed, that the whole trolley including hoist/monorail hoist is in a safe condition again, and that all personnel involved have cleared the installation.

See also "Rules for the safe operation of hoists" in the operation manual **Air hoists/monorail hoists**.

If components other than JDN components are used, danger may occur. Such an application can only be allowed after having received J.D. NEUHAUS agreement.

CONTROLS

Together with the hoist/monorail hoist, JDN motorised trolleys can be operated with the following controls:

Control	Sensitive	
	Yes	No
Rope control	x	
E control		x
F control	x ¹⁾	x

¹⁾ Up to 20 t carrying capacity in special model

E AND F PUSHBUTTON CONTROLS

With pushbutton controls E and F, lifting, lowering and traversing movements can be controlled via pushbuttons. The direction of movement of the load hook and the trolley are marked by arrows above the pushbuttons. All pushbuttons return to the zero position when released.

F PUSHBUTTON CONTROL WITH TWO TRAVEL SPEEDS

- ▶ Low trolley speed: press down corresponding pushbutton halfway until noticing slight resistance.
- ▶ Quick trolley speed: press corresponding pushbutton further down.

EMERGENCY STOP

The E and F controls that are designed for the EU are fitted with an emergency stop button. The same design is available on demand for customers outside the EU.

The emergency stop button, when pressed, locks in the down position and halts the motion of the trolley. All other pushbuttons are then inoperable. The emergency stop can be released once the danger has been eliminated. Operation of the trolley using the pushbuttons can only take place after this has been done.

- ▶ In the event of a hazard, press down firmly on the red emergency stop button.
- ▶ Once the hazard has been removed, turn the emergency stop button slightly to the right to release it. It jumps back into place.

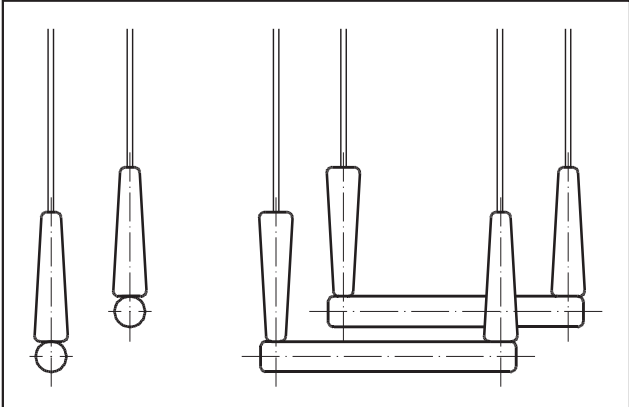


Figure 13: Rope control

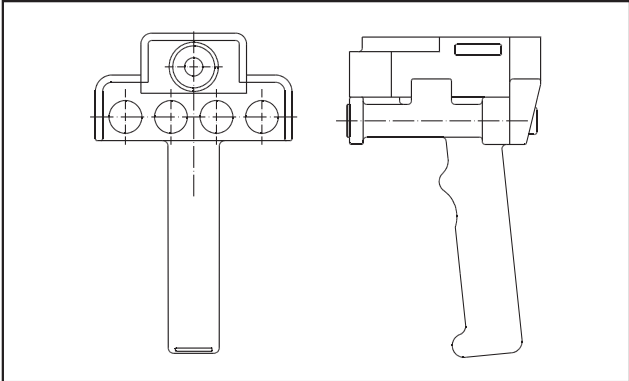


Figure 14: E control

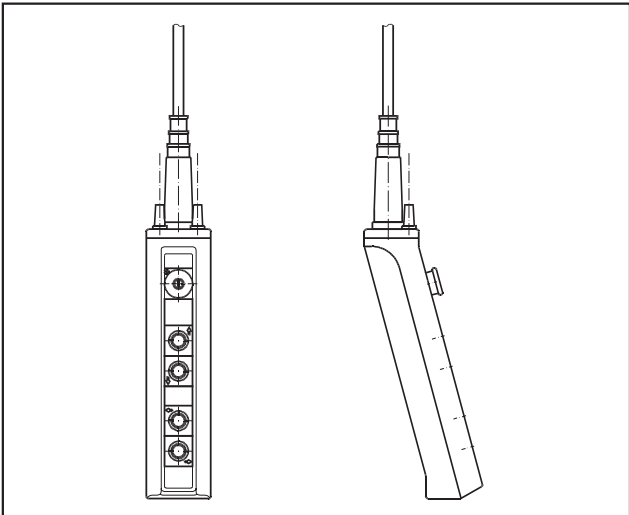


Figure 15: F control

TAKING THE TROLLEY OUT OF OPERATION

PROLONGED SHUTDOWN

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

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

STORAGE

(see section **Storage conditions**, page 20)

DISMANTLING



DANGER OF INJURY!

JDN air hoists must only be dismantled by qualified personnel.

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

DISPOSAL

JDN hoists contain a range of materials which, on expiry of the service life, must be disposed of or recycled where appropriate, in accordance with statutory regulations.

Please note the following list of materials used:

HOIST

- ▶ Ferrous materials
 - Steel
 - Nodular cast iron
- ▶ Non-ferrous metals
 - Bronze
- ▶ Synthetic materials/plastics
 - Polyethylene
 - Polyurethane
 - Polyamide
 - Rubber
 - Epoxy resin
 - Polyacetal
 - Thermosetting casting (brake liner, asbestos-free)

FILTER SILENCER/SERVICE UNIT:

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

MAINTENANCE

MAINTENANCE AND INSPECTION INTERVALS

JDN trolleys are extremely robust and require little maintenance. Compliance with maintenance and inspection intervals is of great importance, in order that the trolleys operate safely and reliably over a period of many years. If the trolley is being operated in a harsh environment that leads to accelerated wear, then the intervals should be reduced.



WARNING!

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

In the case of maintenance work exceeding normal service and maintenance, please contact J.D. NEUHAUS.

For information regarding qualification of maintenance personnel, see the section **Personnel safety**, page 5.

CLEANING AND CARE

If your JDN trolley has to work in dirty surroundings, remove coarse dirt from the trolley.

SPARE PARTS

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

INSPECTION AND MAINTENANCE WORK

REGULAR INSPECTION

Cranes must be inspected by a specialist in accordance with the application and operating conditions as required, but at least once a year. Furthermore, JDN trolleys have to be checked according to the maintenance and inspection list (see **Inspection list**, page 32).

MAINTENANCE LIST

Maintenance measure	Interval	Comment
Checking controls	Daily	see page 36
Checking brake function	Daily	see page 32
Checking end switches (if fitted)	Daily	see page 38



INSPECTION LIST

Inspection measure	Interval	Comment
Check the suspension of travelling girder and end stops for damage	Annually	
Check the locking devices for damage and function	Annually	
Check side plates of trolleys for damage and deformation	Annually	Repl. if necessary
Check running wheels including bearing for damage and tight fastening	Annually	
Check wheel flange wear of running wheels	Annually	See table on page 36
Check toothed wheels (as long as they are open) for damage, wear and lubrication	Annually	Repl. if necessary
Check screw connections for tightness	Annually	Tighten if necessary
Check load bolt for deformation	Annually	Repl. if necessary
Check suspension links for deformation	Annually	Repl. if necessary
Check bolts of running wheels for deformation	Annually	Repl. if necessary
Test brake for function	Annually	See page 32
Check pneumatic parts for damage, function and density	Annually	Repl. if necessary
Check controls for damage and function	Annually	
Check hoses for damage and density	Annually	Repl. if necessary
Check and clean service unit	Annually	see page 36
Check filter silencer for permeability	Annually	see page 36
Replace motor grease (over 6 tons carrying capacity)	As required, At least every 5 years	See page 33
Replace grease packing of rotor (up to 6 tons carrying capacity)	As required, at least every 5 years	See page 35

TESTING THE BRAKE (MOTORISED TROLLEYS)

Test the brake function daily.

When the pushbuttons of the controls are released, the trolley may not keep running for an unusually long time.



CAUTION!

If the trolley keeps running for an unusually long time after braking, the brake has to be repaired.

REPLACING BRAKE DISC IN THE CASE OF MOTORISED TROLLEYS OVER 6 TONS CARRYING CAPACITY

When the brake begins to noticeably lose its effect, it is time to replace the brake disc.

Loosen the four hexagon socket screws (1) in the cover (2) of the motor housing and remove the cover.



CAUTION!

Take care to avoid damaging the brake assembly seals.

- ▶ Pry the brake assembly (4) out of the housing.
- ▶ Draw the brake disc (5) off the end of the rotor.
- ▶ The brake disc should have a thickness of at least 5.5 mm. Measure it, and replace if necessary.
- ▶ Ensure that all sealing rings of the brake assembly are correctly positioned in their grooves.
- ▶ Replace the brake assembly in the housing, pressing it firmly into position.
- ▶ Place the O-ring (3) into position and fasten the cover using the four hexagon socket screws (see the section **Screw retainers and torques**, page 41).



WARNING!

Check the braking action of the trolley under load prior to initial operation.



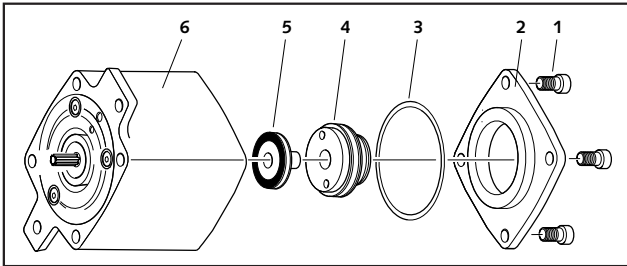


Figure 16: Remove the brake assembly from the housing and replace the brake disc if required

REPLACING MOTOR VANES IN THE CASE OF MOTORISED TROLLEYS OVER 6 TONS CARRYING CAPACITY

When the vanes of the air motor become worn, the motor performs less well, reducing the load capacity of the JDN trolley. In such a case the vanes must be replaced.



CAUTION!

Only trained technicians should be allowed to work on the air motor. Improper work procedures may damage the motor.

- ▶ Loosen the two hexagon socket screws that hold down the housing and carefully remove the motor. In doing so, keep track of the shaft coupling and seal.
- ▶ Unscrew the brake cover, remove the brake assembly and the brake disc from the housing (see the section **Replacing the brake disc**, page 32).
- ▶ Loosen the three hexagon socket screws (8) of the cover (7).
- ▶ Using a soft plastic hammer, carefully tap on the rotor (3) from the brake assembly side to drive it out. The vanes (2) and springs (1) will fall out.

Inspect the rotor running surface to ensure that it is free from mechanical defects.

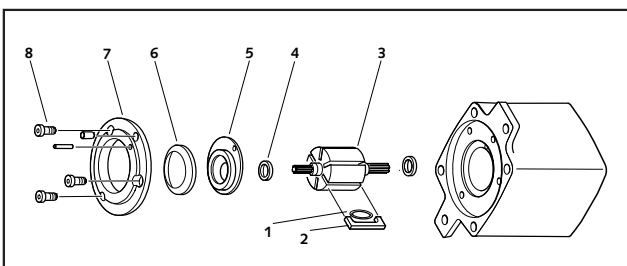


Figure 17: Drive the rotor out from the brake assembly side

▶ **Renewing motor grease**

Before mounting, lightly coat cylinder liner, rotor with slots, vanes and both bearing plates with JDN high-performance grease (part no. 11901).

- ▶ Set the motor housing on its end and replace the rotor in the housing.
- ▶ Insert new vanes with their compressed springs into the rotor slots one at a time, always inserting the vanes at the point where the rotor/cylinder gap is largest (a special vane mounting tool is available from JDN).

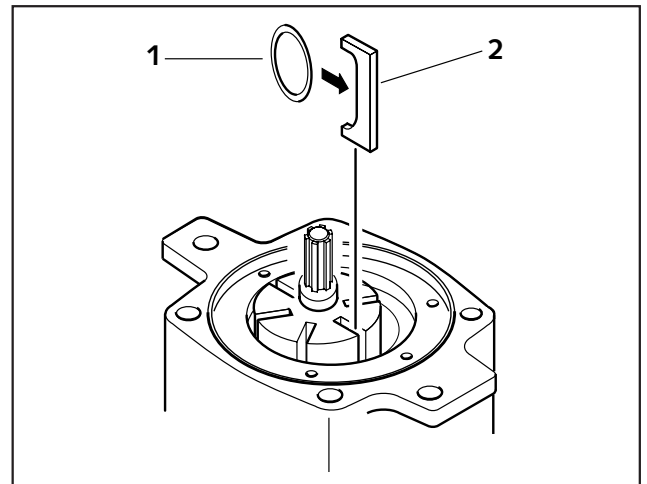


Figure 18: Insert the vanes into the slots where the gap is largest

- ▶ One at a time, place the spacer (4), the bearing disc (5), the plate spring (6) and the cover (7) over the end of the rotor (see Figure 19).
- ▶ Screw down the cover.
- ▶ Mount the brake disc and brake assembly into the opposite end of the housing and close the housing with the brake cover, sealing ring and four hexagon socket screws (see Figure 18).
- ▶ Place the seal into position.
- ▶ Flange-mount the motor to the gearbox using two hexagon socket screws (torque 41 Nm).



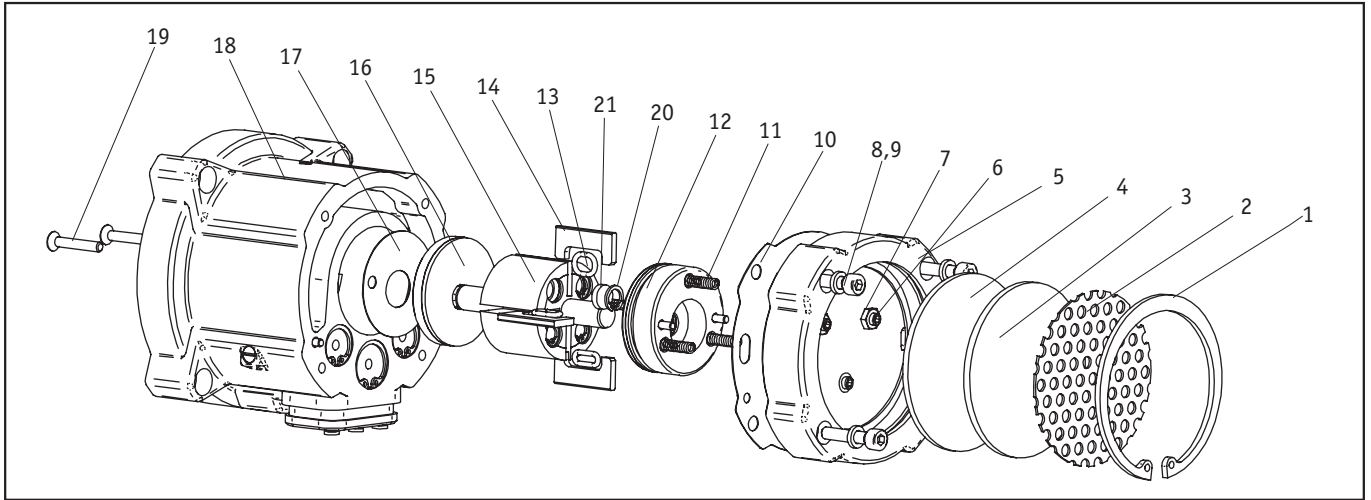


Figure 19: Replacing brake discs, brake piston and vanes/motor assembly for motorised trolleys up to 6 tons carrying capacity

REPLACING BRAKE DISCS, BRAKE PISTON AND VANES/MOTOR ASSEMBLY FOR MOTORISED TROLLEYS UP TO 6 TONS CARRYING CAPACITY

Functional description:

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

ADJUSTING THE BRAKE

- ▶ Remove the retaining ring (1) from the motor cover.
- ▶ Remove the perforated metal plate (2), Vyon plate (3) and felt plate (4).
- ▶ Release the lock nut (7) of the adjusting bolt (6) (3 screws).
- ▶ Screw the adjusting bolt (6) to the stop in the cover; do not tighten.
- ▶ Then screw back the adjusting bolts (6) 45° from the stop, hold and lock with the nuts (7). For operation in areas with ambient temperatures exceeding 30° C, the adjustment has to be carried out with the motor warmed up accordingly.
- ▶ Refit the felt plate (4), Vyon plate (3), perforated metal plate (2) and retaining ring (1).

REMOVAL

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

- ▶ Disconnect the trolley from the main air supply.
- ▶ Remove the retaining ring (1) from the motor cover.
- ▶ Remove the perforated metal plate (2), Vyon plate

- (3) and felt plate (4).
- ▶ Release the lock nut (7) of the adjusting bolt (6) (3 screws)
- ▶ Remove the cover bolts (8) and detach the cover (5) with its seal (10) (when the cover bolts are removed, brake spring tension (11) is fully released).
- ▶ Remove the springs (11).
- ▶ Remove the brake piston (12) from the internal cylinder integrated in the motor housing (18).
- ▶ Pull out the rotor (15), catching the vanes (14) and starting aids (13).

Note

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

- ▶ After removing the countersunk screws (19), the brake disc (16) can be removed with its seal (17). The motor has to be disconnected from the gearbox in order to access the countersunk screws (19).
- ▶ Check the brake disc (16) and brake piston (12) for wear and damage, replace if necessary. The circular wear pattern must not be deeper than 0.2 mm. The extremely low-wear braking material will not reach the wear limit of 0.2 mm within the design-dependent service life of the trolley under intended use.
- ▶ Check vane wear (see illustration Checking vane wear). When the air motor vanes are worn, the motor power and consequently the travelling performance of the trolley are reduced (particularly when loaded). Replacing the vanes together with the starting aids.



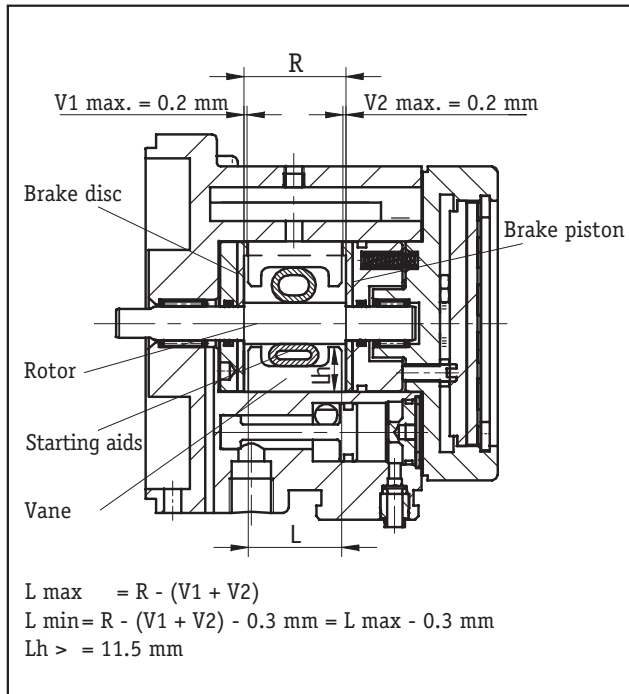


Figure 20: Checking vane wear

ASSEMBLY/MOTOR LUBRICATION

- ▶ Insert the brake disc (16) with its seal (17) into the motor housing (18) and bolt down using the counter-sunk screws (19) (torque 2 Nm); lightly coat the braking side of the brake disc with high-performance grease (JDN part no. 11901).
- ▶ Lightly coat the inside of the rotor contact surface of the motor housing (18) with high-performance grease.
- ▶ Lightly coat the vane slots, cylinder and end surfaces of the rotor (15) with high-performance grease and insert into the housing bearing with the clutch side first.
- ▶ Lightly coat the vanes (14) with high-performance grease and insert into the rotor slots with the starting aids (13).
- ▶ Lightly coat the entire brake piston surface (12) including its seal with high-performance grease and push it into the motor housing (18) with the braking surface first; note the correct position of the eccentric bore.
- ▶ Lightly coat the outer rotor bearing (needle bush bearing point) (15) with high-performance grease as well.

- ▶ If required, renew the grease packing in the rotor chambers (every 400 hours, at least every 5 years).
 Note: The rotor chambers are only emptied by approx. 60 %. In this condition, refilling must be performed. The retaining rings (20) and Vyon washers (21) behind them must be removed from the rotor in order to refill the chambers. Then fill the lubricant chambers with high-performance lubricant without forming cavities! Use new Vyon washers (21) to close off the lubricant chambers and secure these using retaining rings (20).
- ▶ Insert the brake springs (11) into the bores of the brake piston (12).
- ▶ Install the cover (5) (torque 5 Nm), ensure correct seating of the brake springs (11) and locating pins to the motor housing (18) and brake piston. Screw back the adjusting bolts (6) beforehand.
- ▶ Do not tighten the four adjusting bolts (6) after bolting the cover in place; only screw them in loosely to the stop in the cover (5). Screw back the lock nut (7) sufficiently beforehand.
- ▶ Adjust the brake according to the section "Adjusting the brake" on page 31.
- ▶ Refit the felt plate (4), Vyon plate (3), perforated metal plate (2) and retaining ring (1).



WARNING!

Check the braking action of the trolley under load prior to initial operation. Check the motor power at the same time. In the event of low motor power, regulate the adjusting bolts again.

TESTING THE CONTROLS

(motorised trolleys)

Check that the pushbuttons function without sticking, once a day.

The pushbuttons must return to the zero position automatically after being released.



CAUTION!

If a pushbutton is difficult to operate or remains in the pressed position, do not use the trolley. The controls must be repaired.

CHECKING THE SILENCER FOR PERMEABILITY

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

In the event of notably reduced values, the silencer elements must be cleaned or replaced.

CHECKING THE SERVICE UNIT

See also operation manual of the air hoist.

OIL DROP RATE

- ▶ **LM 2 t:** 2 drops per minute
- ▶ **LM 3.2 t to LM 16 t:** 10 drops per minute

WHEEL FLANGE WEAR OF RUNNING WHEELS

When the limit dimensions at the wheel flanges are reached (see table), the running wheels have to be replaced.

If necessary, the clearance between wheel flange and outer edge of the girder flange has to be readjusted before the limit dimension G at the wheel flanges is reached.

Running wheel diameter	50	60	70*	80	84*	165	185	250
Limit dimension G at the wheel flanges	3	5	9	6	10	6	12	12

*Wheel flanges with gears

Dimensions in mm

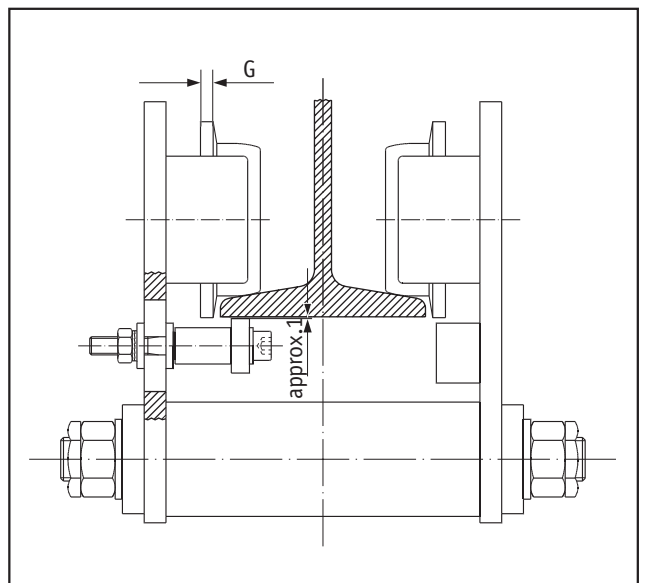


Figure 21: Limit dimension G at the wheel flanges



TROUBLESHOOTING GUIDE

Fault	Possible cause	Remedy
Trolley cannot be moved	EMERGENCY STOP button pressed	If there is no danger, release EMERGENCY STOP button
	Motor run dry, rotor is stuck	Repair the motor, check the service unit (fill with oil, remove water) or renew grease lubrication
Trolley can only be moved slowly or not at all	Defective control device	Have control device repaired
	Control lines leaking or bent	Have lines repaired
	Motor vanes worn	Replace motor vanes
	Control valve on motor faulty	Have control valve repaired
	Two-way valve in the motor defective	Have shuttle valve repaired
	Air pressure too low	Increase air pressure or hose section
	Plug-in connection of control lines not properly plugged in	Check plug-in connection (try to press hoses in further)
Track of trolley too narrow	Adjust the clearance between the wheel flange and the outside edge of the bottom flange of the trolley girder	
Trolley speed reduces when operated for a long period or the motor stops	Brake piston setting too tight	Correct adjustment of brake piston. At high ambient temperatures, perform adjustment with the motor warmed up accordingly.
Trolley can only be moved slowly or not at all	Brake does not bleed fully	Increase air pressure to 6 bar. Check brake seal for leaks and replace seal if required.
	Brake lining and/or brake piston worn	Replace brake lining and/or brake piston.
Trolley is repeatedly blocked at the same place	Tracks are uneven or rail joint displaced	Rectify track faults
	Curve radius too narrow	Increase curve radius



ACCESSORIES

F CONTROL WITH TWO TRAVEL SPEEDS

Apart from the standard speed, the F control in special model also offers a lower travel speed which is about 1/2 of the standard speed, thus enabling easier positioning of the trolley, for example.

FILTER SILENCER

Using a filter silencer improves both filtering and noise suppression:

- ▶ 99.9 % of all oil aerosols from the motor lubrication are filtered out of the air by the filter elements.
- ▶ The noise insulation reduces noise levels by 3 to 4 dB (A) compared with the standard silencer (sinter plate).

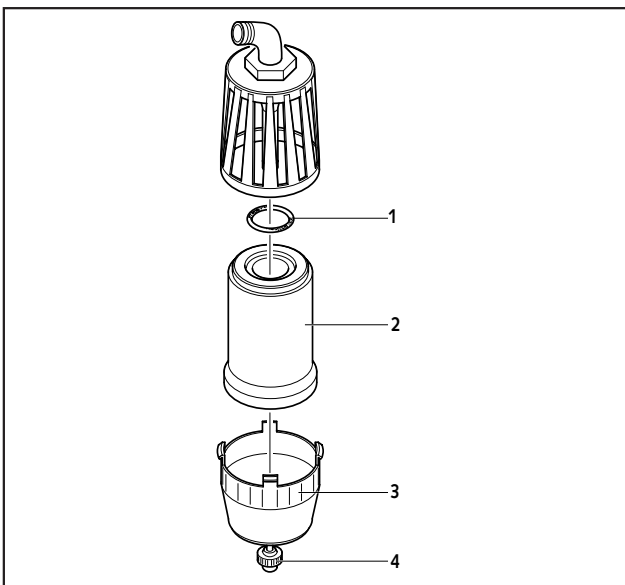


Figure 22: Filter silencer

MAINTENANCE OF FILTER SILENCER

The emulsion that is filtered out of the air collects in the transparent cup (3). This cup must be emptied before the fluid level reaches the filter element (2).

- ▶ 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.

END STOP DEVICES

End stop devices are used in addition to track limiters (e.g. buffers) to limit the path of the motorised trolley (see Figure 23).

TESTING THE END STOP DEVICES

- ▶ To check the functions of the end switches, drive the trolley into the two end positions. The end switch must deactivate the movement.
- ▶ There must be sufficient distance to the track limit (e.g. buffer) behind the end switch to enable the trolley to run out.

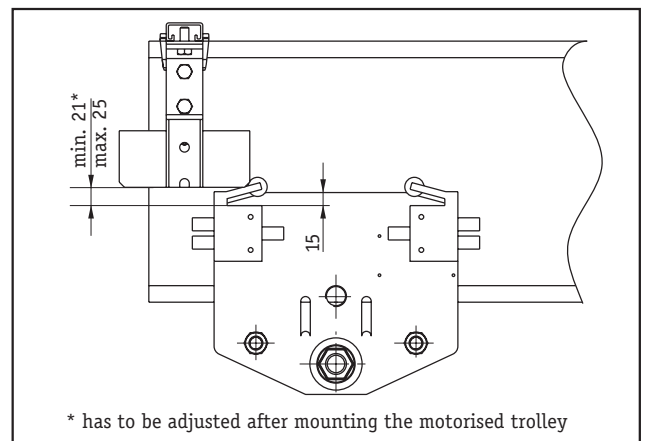


Figure 23: Adjusting the end stop device

BOOSTER UNIT

In the event of a control hose length exceeding 10 m, the reaction times of the pushbutton controls increase significantly. Consequently, a booster unit is generally installed on the motor for controls E and F, reducing the reaction times.

SPRING-LOADED PRESSURE ROLLERS

For special working conditions such as driving curves or other extraordinary tractive resistances, for example, JDN trolleys can be equipped with spring-loaded pressure rollers as an alternative to the rack-and-pinion drive, thus ensuring sufficient traction even in the unloaded condition.

The necessary pressure is to be set after mounting the trolley on the girder (references in the spare parts list).

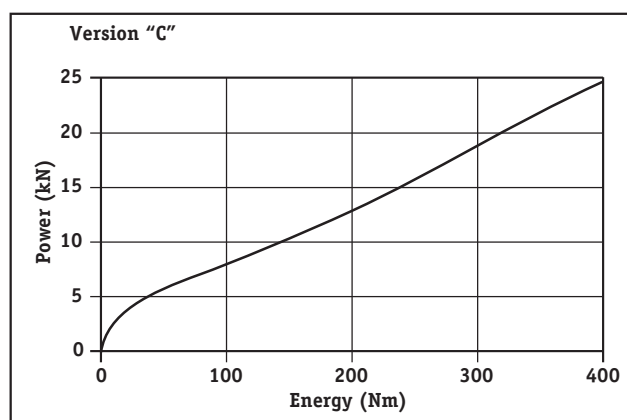
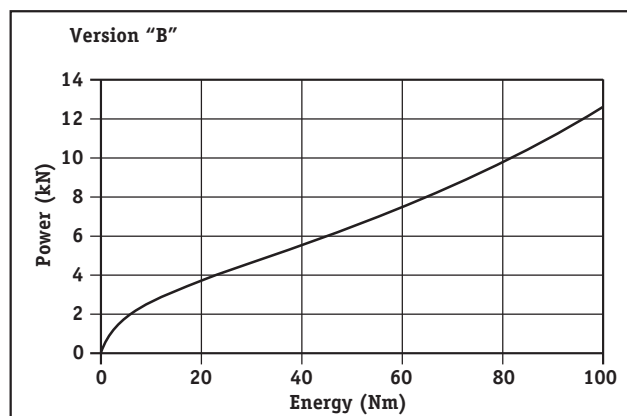
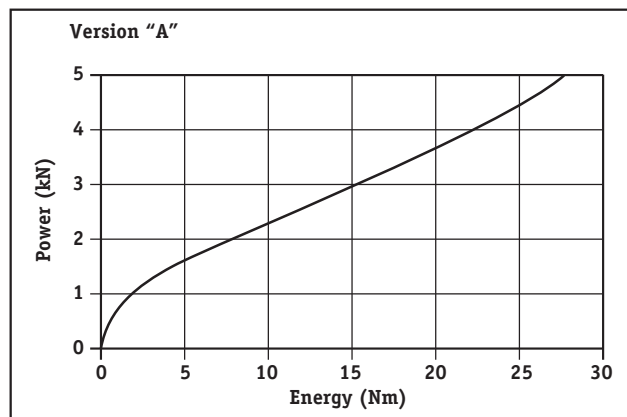
CLAMPING TROLLEY BUFFER

WORKING CONDITIONS

- ▶ The clamping trolley buffers are only suitable for the impact of the trolley wheel against the rubber element.
- ▶ The maximum running wheel diameter is 112 mm in version "A" and 160 mm in versions "B" and "C".
- ▶ The clamping trolley buffer is not suitable for limiting the travel way of trolleys transporting people (driver's cabin) or overhead cranes.
- ▶ The version "C" is limited to a maximum power of 15 kN in case of a crash hazard of the trolley.
- ▶ A regular (normal working conditions) running foul is not allowed.
- ▶ The clamping trolley buffers are suitable for use on parallel-flanged girders made of material S235/oil and grease-free.
- ▶ The rigid seating of the clamping trolley buffers must be checked regularly.
- ▶ The selection of the suitable clamping trolley buffers from the selecting table can only be made for J.D NEUHAUS hoists. In special cases or in case of third party hoists, the selection is made with the help of the buffer characteristics below.
- ▶ The top temperature of the buffer element in permanent use is 80° C.
- ▶ When driving the clamping buffer with a metal sheet running vertically to the trolley travel way instead of with the trolley running wheel, the maximum admissible buffer end power is reduced by 50 %. This is also valid for using the clamping buffers as a crash safety device (in this case the maximum buffer end power of version "C" is limited to 7.5 kN). Furthermore, it has to be ensured that damage to the buffer element is avoided.

- ▶ It is also possible to use the clamping buffers on parallel-flanged girders made of material S355 when the maximum admissible buffer end power is reduced by 50 %.

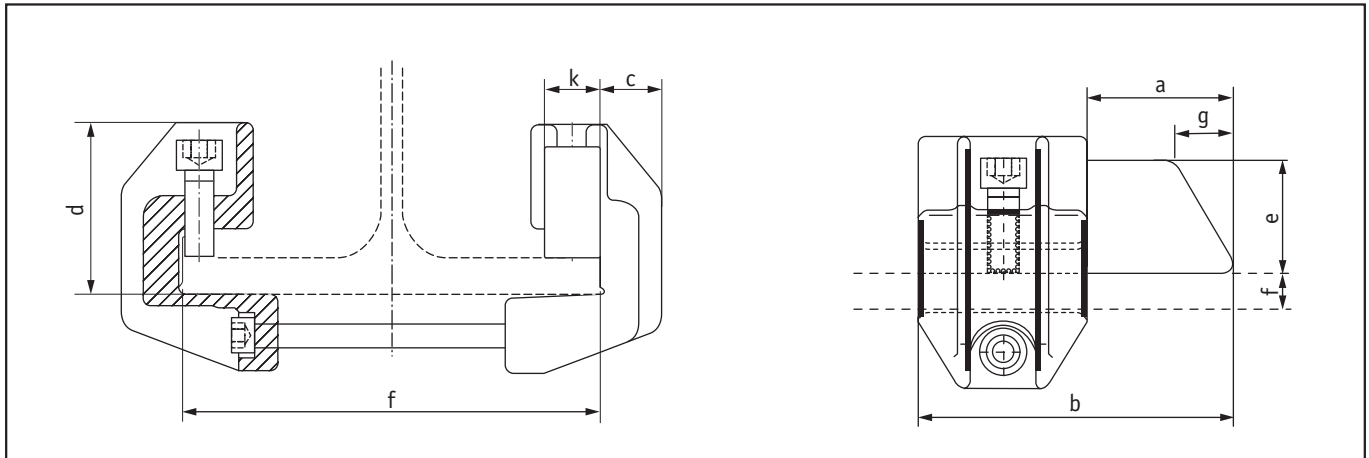
CLAMPING BUFFER CHARACTERISTICS



SELECTING TABLE

Trolley Type	Max. load [t]	Version	Flange thickness t [mm]	Flange width f [mm]	Part No.
All types	1.0	"A"	≤ 20.5	64 - 120	74570
				121 - 190	74571
				191 - 243	74572
				244 - 300	74573
All types	3.5	"B"	13.0 - 30.0	110 - 160	74574
				161 - 230	74575
				231 - 283	74576
				284 - 340	74577
All types apart from UH 12	10.0 9.0 for UH 12	"C"	20.0 - 30.0	161 - 230	74578
				231 - 283	74579
				284 - 340	74580

DIMENSIONS



Version	Dimensions [mm]							Weight [kg]
	a	b	c	d	e	g	k	
"A"	45	110	20	63	40	15	26	2.6
"B"	80	170	32	90	60	35	30	5.9
"C"	97	185	32	90	79	55	46	6.1

APPENDIX

SCREW RETAINERS AND TORQUES

Type	LN up to 2 t	LM 2 t/LH 2 t	L 3.2 t	L 6.3 t	L 10-16 t/EH 25
Spacing			Threaded bolt	Threaded bolt	Threaded bolt
Adjustment			Infinitely variable	Infinitely variable	Infinitely variable
Locked by			Nut M 16	Nut M 24	Nut M 24
Torque			60 Nm	200 Nm	200 Nm
Secured by			Nord-Lock disc	Nord-Lock disc	Nord-Lock disc
Load receiver	Clevis load bar	Clevis load bar	Bolt		
Adjustment	Gradually in 1.5 mm increments	Gradually in 1.5 mm increments	Spacer discs ^{Version¹⁾}		
Locked by			Nut M 24	Castle nut M 48	Nut M 48
Torque			200 Nm	1000 ... 1500 Nm	1700 Nm
Secured by		Optional: Nut with threadlocking	Safety nut	Tension pin	Safety nut

¹⁾ Please observe delivered version

Type	EH 10/EH 16/EH 20/EH 25 S	L 20 t/EH 37/EH 75	L 25 t/EH 37 S/EH 50/EH 100
Spacing	By load receiver	Bolt	By load receiver
Adjustment	–	Fixed	–
Locked by	–	Nut M 30	–
Torque	–	400 Nm	–
Secured by	–	Safety nut	–
Load receiver	Bolt	Bolt	Bolt
Adjustment	Fixed	Fixed	Fixed
Locked by	Nut M 64	Nut M 48	Nut M 100
Torque	Hand tight	1700 Nm	Hand tight
Secured by	Safety ring	Safety nut	Safety ring



TIGHTENING THE SAFETY NUTS

Screw on nuts firmly by hand, then tighten them with a spanner by 1/4 to 1/2 turn

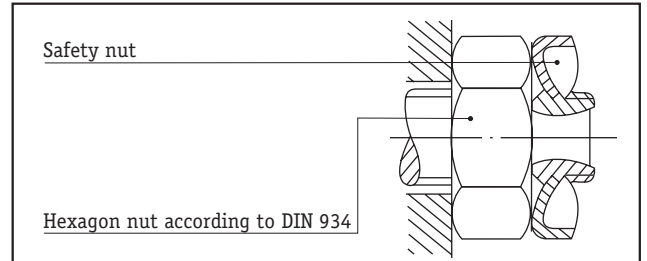
UNSCREWING THE SAFETY NUTS

Tighten the hexagon nut until the spring effect of the locking teeth has been released. The safety nut can then easily be removed.

FITTING THE NUT WITH THREADLOCKING

The clevis load bar is secured against twisting by means of the side plates by screwing the nut with threadlocking with a torque of 100 Nm (corresponds to a hand force of 30 kg with a spanner length of 33 cm) against the inside of the side plate on both sides.

In the case of trolley track girder widths under 100 mm, the locking nuts are screwed onto the ends of the clevis load bar after the side plates have been mounted so that they are screwed against the outside of the side plates with the torque of 100 Nm to secure them.



TECHNICAL DATA

The designation of the trolley is composed of the short designation (LN, LH, LM) and the carrying capacity acc. to table, as for example LN 1t.

JDN Air Hoist PROFI	Type	025 TI	05 TI	1 TI	2 TI	3 TI	6 TI	10 TI	16 TI	
Carrying capacity of trolley LN	t	0.5		1	2	3.2	6.3	10-16 t		
Carrying capacity of trolley LH and LM	t	2				3.2	6.3	10-16 t		
Carrying capacity of hoist with trolley	t	0.25	0.5	1	2	3.2	6.3	10	16	
Weight of manual trolley	kg	7.7		10.5	18	26	117	120		
Weight of reel chain	kg	32				37	127	130		
Weight of motorised trolley	kg	26				33	124	130		
Weight of hoist with standard lift	kg	27	27	28	34	86	110	156	240	
Total weight with standard lift of LN	kg	34.7	34.7	38.5	52	112	227	276	360	
Total weight with standard lift of LH	kg	59	59	60	66	123	237	286	370	
Total weight with standard lift of LM	kg	53	53	54	60	119	234	286	370	
Weight of 1 m chain	kg	1			3.8		5.8			
Chain acc. to DIN 5684-8	mm	7 x 21			13 x 36		16 x 45			
Number of chains		1		2	1	2	2	3		
Air pressure of motorised trolley	bar	6								
Air consumption of motorised trolley at nominal load	m ³ /min	0.6						1.3		
Air consumption of hoist at nominal load	m ³ /min	1.5				5.5				
Motor rating of motorised trolley	kW	0.2						0.7		
Motor rating of hoist	kW	1				3.5				
Distance travelled with 10 m of hand chain reeled off	m	0.75						1.5		
Travel speed of motorised trolley at nominal load	m/min	9*/14						5*/12		
Hose connection of motorised trolley		G 1/2				G 1				
Minimum curve radius with LN	m	0.9 ¹	1.0 ¹	1.2 ¹	0.5 ²	1.0 ²				
Minimum curve radius with LH and LM	m	0.5 ²				1.0 ²				
Max. bottom flange thickness t with LN	mm	34	30		40	65				
Max. bottom flange thickness t with LH and LM	mm	40				65				
Max. bottom flange width b with LN	mm	220		305		310				
Max. bottom flange width b with LH and LM	mm	300				310				
Max. bottom flange width b with LN	mm	50	58	66	54	125				
Max. bottom flange width b with LH and LM	mm	50				54	125			
Sound level of motorised trolley ³	dB (A)	80								

* 1st speed of F control with two travel speeds

¹ Measured at centre of girder

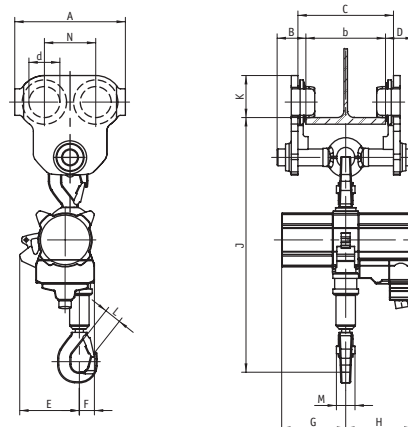
² Measured at inner edge of girder

³ Measured at 1 m distance



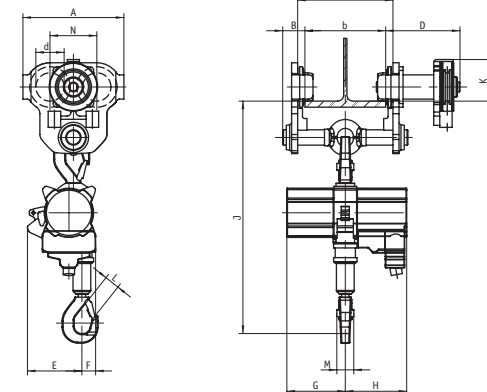
MANUAL TROLLEYS (LN)

JDN Air Hoist PROFI	Type	025 TI	05 TI	1 TI	2 TI	3 TI	6 TI	10 TI	16 TI	
in trolley		LN 0.5t		LN 1t	LN 2t	LN 3.2t	LN 6.3t	LN 10-16 t		
A	mm	260		310	292	500	490			
B max.		119		122	162	113	141	146		
C		b + 28		b+26	b+60	b + 70				
d		55		68	80	84	165			
D max.		126		166		113	141	146		
E		137			187		154	197	199	
F		39			46		79	109		
G		145			233		308	382		
H		152			250		267	310		
J* mounted		-	-	-	-	635	763	944	997	
J* suspended		530			597	798	919	1131	1215	
K		67,5		81,5	94	107	198			
L		28			30		40	44	53	
M		42			51		66	82		
N	130			150	136	236				



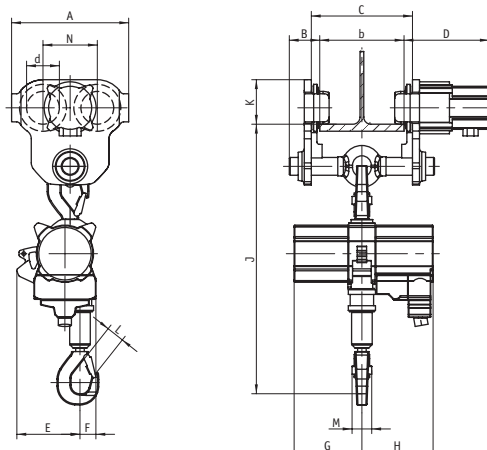
REEL CHAIN TROLLEYS (LH)

JDN Air Hoist PROFI	Type	025 TI	05 TI	1 TI	2 TI	3 TI	6 TI	10 TI	16 TI	
in trolley		LH 2 t				LH 3.2t	LH 6.3t	LH 10-16 t		
A	mm	250		292		500	490			
B max.		130		113		141	146			
C		b + 36		b+60		b + 70				
d		70		84		165				
D max.		183		297		307	312			
E		137			187		154	197	199	
F		39			46		79	109		
G		145			233		308	382		
H		152			250		267	310		
J* mounted		-	-	-	-	635	763	944	997	
J* suspended		563			611	798	919	1131	1216	
K		103		110		198				
L		28			30		40	44	53	
M		42			51		66	82		
N	116			136		236				



MOTORISED TROLLEYS (LM)

JDN Air Hoist PROFI	Type	025 TI	05 TI	1 TI	2 TI	3 TI	6 TI	10 TI	16 TI	
in trolley		LM 2 t				LM 3.2t	LM 6.3t	LM 10-16 t		
A	mm	250		292		500	490			
B max.		130		113		141	146			
C		b + 36		b+60		b + 70				
d		70		84		165				
D max.		185		191		205	312			
E		137			187		154	197	199	
F		39			46		79	109		
G		145			233		308	382		
H		152			250		267	310		
J* mounted		-	-	-	-	635	763	944	997	
J* suspended		563			611	798	919	1131	1216	
K		95		107		215				
L		28			30		40	42	55	
M		42			51		66	82		
N	116			136		236				



* Without chain box









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