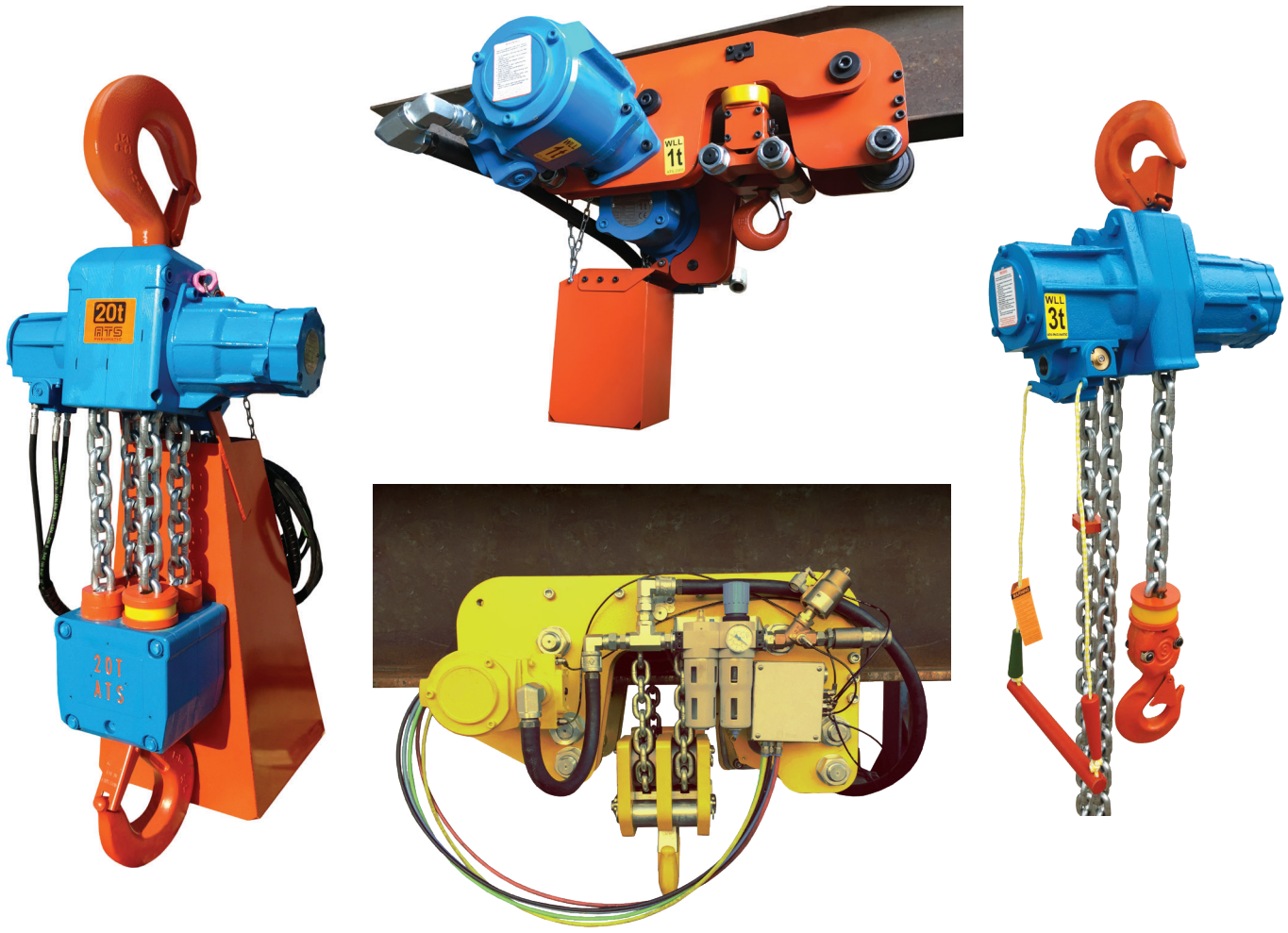
ATS PNEUMATIC USER MANUAL



ELEPHANT
LIFTING PRODUCTS™

ATS
PNEUMATIC

CONTENTS

This operation manual edition 4/2023 covers the following ATS Trolleys and Hoists:

- Manual trolleys
- Hand chain trolleys
- Motorized trolleys
- Low headroom trolleys
- Monorail hoists
- Ultra-low hoists
- Hook Mount Hoists

It must be read carefully and in its entirety before operating any hoist.

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

Serial No.

Please enter the Serial No. of your ATS hoist/trolley here

1 WARRANTY

ELEPHANT LIFTING PRODUCTS, LLC warrants to the user its Hoists, and Trolleys to be free from defects in material and workmanship for a period of one year from the date of purchase.

ELEPHANT LIFTING will at its discretion repair without cost to the user (including parts and labour charges) for any product found to be defective. ELEPHANT LIFTING may, at its option, replace such product(s) and refund the purchase price less a reasonable allowance for handling in exchange for the defective product(s). All repaired and replaced product(s) are warranted for the remainder of the original warranty period.

If any product proves defective within its original one-year warranty period, it must be returned to ELEPHANT LIFTING PRODUCTS, LLC with proof of purchase and the original test certificate.

This warranty does not apply to products which ELEPHANT LIFTING has determined to have been misused, abused and improperly maintained by the user or where the malfunction or defect was attributed to using non-genuine ELEPHANT LIFTING parts.

ELEPHANT LIFTING PRODUCTS, LLC makes no other warranty and its maximum liability is limited to the purchase price of the product and in no event, will ELEPHANT LIFTING PRODUCTS, LLC be liable for any consequential, indirect, incidental or special damages of any nature arising from the use of the product whether based on contract or otherwise.

It is ELEPHANT LIFTING PRODUCTS, LLC policy to promote safety of all personnel in the workplace. All products manufactured are thoroughly checked, packed and inspected before dispatch. Any loss or damage which occurs during shipment while en-route must be reported to ELEPHANT LIFTING immediately. Should any item be delivered to the customer in apparent good condition, but upon opening the container, loss or damage has taken place while in transit; notify ELEPHANT LIFTING PRODUCTS, LLC immediately.

Should any items be delivered back to ELEPHANT LIFTING PRODUCTS, LLC all transport costs will be on the account of the user.

These instructions are prepared by ELEPHANT LIFTING PRODUCTS, LLC for the purpose of maintenance, repair and the use of its air hoists.

No responsibility for failure of equipment due to manufacturing procedure will be assumed if these instructions are not carried out. Only original ELEPHANT LIFTING supplied spares are to be used in all repairs.

2 SAFETY INFORMATION

The user/owner and all other relevant personnel shall comply with local regulations as applicable.

NOTICE

This manual is written to be applicable to ELEPHANT LIFTING hoists, or ELEPHANT LIFTING hoists mounted on/integral to ELEPHANT LIFTING trolleys

THIS MANUAL MUST BE READ BEFORE USING OR REPAIRING THESE PRODUCTS.

This manual contains important safety, installation, operation, maintenance and repair information. Make this manual available to all persons responsible for the operation, installation, maintenance and repair of these products.

Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain this hoist in accordance with South African Bureau of Standards Specification number SANS1638:2008 pneumatically powered chain hoists and SANS 1639:2010 Reconditioned pneumatically powered chain hoists and any other safety codes or procedures relevant to the industry in which the hoist is being used. Testing of chain hoists must only be carried out by the competent person contemplated in SANS 1639:2010.

The Occupational Health and Safety Act and Mine Health and Safety Act and other recognized safety sources make a common point: Employees who work near cranes or assist in hooking on or arranging a load should be instructed to keep out from under the load. From a safety standpoint, one factor is paramount: conduct all lifting operations in such a manner that if there were an equipment failure, no personnel would be injured. This means keep out from under a raised load and keep out of the intended path of any load.

ELEPHANT LIFTING industrial and mining hoists are manufactured in accordance with the latest ISO9001 standards.

The Occupational Safety and Health Act of 1993, section 10 states:

(1) Any person who designs, manufactures, imports, sells or supplies any article for use at work shall

ensure, as far as is reasonably practicable, that the article is safe and without risks to health when properly used and that it complies with all prescribed requirements.

(2) Any person who erects or installs any article for use at work on or in any premises shall ensure, as far as is reasonably practicable, that nothing about the manner in which it is erected or installed makes it unsafe or creates a risk to health when properly used.

(3) Any person who manufactures, imports, sells or supplies any substance for use at work shall:

- Ensure, as far as is reasonably practicable, that the substance is safe and without risks to health when properly used; and

- Take such steps as may be necessary to ensure that information is available with regard to the use of the substance at work, the risks to health and safety associated with such substance, the conditions necessary to ensure that the substance will be safe and without risks to health when properly used and the procedures to be followed in the case of an accident involving such substance.

(4) Where a person designs, manufactures, imports, sells, or supplies an article or substance for or to another person, and that other person undertakes in writing to take specified steps sufficient to ensure, as far as is reasonable practicable, that the article or substance will comply with all prescribed requirements and will be safe and without risks to health when properly used, the undertaking shall have the effect of relieving the first mentioned person from the duty imposed upon him by this section to such an extent as may be reasonable having regard to the terms of the undertaking.

It is the owner's and user's responsibility to determine the suitability of a product for any particular use. It is recommended that all applicable industry, trade association and legislation be checked. Read all operation instructions and warnings before operation.

This manual has been produced by ELEPHANT LIFTING to provide agents, fitters, and company personnel with the information required to install, operate, maintain and repair the products described herein.
It is extremely important that fitters and operators be familiar with the servicing procedures of these products, or similar products, and are physically capable of conducting the procedures. These personnel shall have a general working knowledge that includes:

1. Proper and safe use and application of fitter's common hand tools as well as special or recommended tools.
2. Safety procedures, precautions and work habits established by accepted industry standards.

ELEPHANT LIFTING cannot know of, nor provide, all the procedures by which product operations or repairs may be conducted and the hazards and/or results of each method. If operation or maintenance procedures not specifically recommended by the manufacturer are conducted, it must be ensured that product safety is not endangered by the actions taken. If unsure of an operation or maintenance procedure, personnel should place the product in a safe condition and contact supervisors for technical assistance.

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

This manual refers to existing legal requirements and engineering practices as known when this document was written. Should any such legislation or practice change or be "enlarged" upon then due consideration must be taken. Various standards have been used to assist in compiling this document and will be listed where applicable, however, it is ultimately the responsibility of the user to ensure all local requirements are met.

The instructions given in this manual must be interpreted and applied using sound judgment.

Always keep the manual readily available at the location where the ELEPHANT LIFTING hoist/trolley is being used.

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

2.1 For Hoists used outside of the Republic of South Africa:

The user/owner and all other relevant personnel 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.

Some suggested resources are listed below, based on region. This should not be considered an exhaustive list.

2.1.1 USA

It is the responsibility of the owner/user to install, inspect, test, maintain, and operate a hoist in accordance with ANSI/ASME B30.16, "Safety Standard for Overhead Hoists" and OSHA regulations. If the hoist is installed as part of a total lifting system, such as an overhead crane or monorail, it is also the responsibility of the owner/user to comply with the applicable ANSI/ASME B30 volume that addresses that type of equipment.

It is the responsibility of the owner/user to have all personnel that will install, inspect, test, maintain, and operate a hoist read the contents of this manual and applicable portions of ANSI/ASME B30.16, "Safety Standard for Overhead Hoists" and OSHA Regulations. If the trolley is installed as part of a total lifting system, such as an overhead crane, the applicable ANSI/ASME B30 volume that addresses that type of equipment must also be read by all personnel.

If the trolley owner/user requires additional information, or if any information in the manual is not clear, contact ELEPHANT LIFTING or the distributor of the hoist. Do not install, inspect, test, maintain, or operate this hoist unless this information is fully understood.

A regular schedule of inspection of the hoist in accordance with the requirements of ANSI/ASME B30.16 should be established and records maintained.

2.2 Organizational Safety Measures

The use of powerful lifting equipment is subject to certain hazards that cannot be overcome by mechanical means but only by the exercise of intelligence, care and

common sense. It is therefore essential that personnel involved in the use and operation of this equipment must be competent, careful, physically and mentally qualified, and trained in the safe operation of lifting equipment and the handling of loads. Serious hazards exist such as; overloading, dropping, or slipping of the load caused by improper hitching or slinging, obstructing the free passage of the load and using equipment for a purpose/or in an environment for which it was not intended or designed. The above can lead to fatal consequences.

Operators of ELEPHANT LIFTING Hoists are under obligation to ensure safe and hazard-free operation. This can be achieved, in part, through the following measures:

- Keep the operation manuals available at the hoist operating site,
- Perform regular training,
- Perform regular inspections (at least once annually) see Section 8,
- Implement an inspection log and make regular accurate entries,
- regularly check personnel for safety and hazard awareness during work.

2.3 Competent Person

The hoist/trolley must be operated, inspected, maintained, and repaired under the supervision of a competent person:

1. Who is qualified by virtue of their knowledge, training, skills and experience to organize the work and its performance.

2. Who is familiar with the legal requirements, occupational safety, and accident prevention regulations which apply to the work to be performed.

3. Who has been trained to recognize and assess any potential or actual danger to health and safety in the performance of the work.

Any individual using the hoist/trolley has the responsibility to:

- follow the operating instructions of their workplace
- Comply with health and safety and accident prevention regulations.
- Ensure that they are properly informed regarding working with hazardous materials.
- Follow the safety instructions set out in the operation manuals.

2.4 Operating Environment

ELEPHANT LIFTING PRODUCTS, LLC fully realizes the importance of proper design factors, minimum and maximum sizes and other limiting dimensions of the chain and its fastenings, sprockets and similar equipment all of which are designed with safety in mind.

The condition of lifting equipment can be affected by the environments it is used in. This may cause corrosion or wear and other effects unique to its specific application. In light of this, it is the responsibility of the owner to ensure the hoist is inspected, maintained, and repaired under the supervision of a competent person as described in Section 2.3

2.5 Precaution Signs

Throughout this manual there are steps and procedures which, if not followed, may result in injury, death, and/or destruction to property. The following signal words are used to identify the level of potential hazard.

Danger is used to indicate the presence of hazard which

DANGER

will cause ***severe*** injury, death or substantial property damage if the warning is ignored.

WARNING

Warning is used to indicate the presence of a hazard which ***can*** cause ***severe*** injury, death, or substantial property damage if the warning is ignored.

CAUTION

Caution is used to indicate the presence of a hazard which ***will*** or ***can*** cause minor injury or property damage if the warning is ignored.

NOTICE

Notice is used to notify people performing operation, installation, inspection and maintenance information which are important but not hazard-related.

2.6 Safety Summary

DANGER

- **Never allow any person to sit on or stand under the hung load. Always keep out of the intended path of any load.**
- **Ensure that the Hoist is free from load, before performing any maintenance.**
- **Installation, repair and maintenance of the Hoist must be performed only by competent personnel.**
- **Ensure that the cumulative load does not exceed the rated capacity of the Hoist, factors to be considered include rigging equipment, and dynamic loads.**
- **Ensure that the structure to which the Hoist/trolley is attached and any load attaching device(s) used in conjunction with the Hoist/trolley can handle the static and dynamic load(s), when the hoist is lifting and lowering the rated load. (if in doubt, consult a registered professional structural engineer).**
- **ELEPHANT LIFTING hoists may only be used in an ATEX environment if it conforms to the specific declaration made on the hoists name plate. Contact ELEPHANT LIFTING for further information if any ambiguity exists.**
  See Section 16 for further information.

WARNING

- **Never attempt to use the Hoist if its safety Latch has been broken.**
- **Never remove labels or name plate from the Hoist.**
- **Never use any mechanical operating forces other than manual pulling force on chain block hoists.**
- **Do not drop, throw, or drag the Hoist/Trolley.**
- **Before installing the Trolley, ensure that the Hoist is not obstructed, and that it will move freely for the intended work.**
- **Always, keep the Hoist clean.**
- **Never leave a Hoist with a hung load and ensure that stoppers are installed at the end of the beam.**
- **Do not use the Hoist for lifting or transporting people and/or lifting or supporting loads over people.**
- **Never use twisted, cut, added or damaged load chain. Damage can present as distortion, cracks, excessive elongation, corrosion or wear.**
- **Always, perform an inspection before the start of work.**
- **Only original ELEPHANT LIFTING supplied spares are to be used in all repairs.**
- **Never modify any part of the Hoist**

NOTICE

Lifting equipment is subject to different regulations in each country. These regulations may not be specified in this manual.

Whenever a conflict arises between the contents of this manual and any other applicable legislation, standard or procedure, the more stringent of the two must be applied.

3 PRODUCT INFORMATION

3.1 Identification

The nameplate mounted on the hoist/trolley identifies the type of ELEPHANT LIFTING hoist/trolley and contains important rating data.

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

ELEPHANT LIFTING PRODUCTS, LLC

38381 N Robert Wilson Rd, Suite A
Gonzales, Louisiana 70737
USA
Phone (225) 644-6113
Fax (225) 644-6695
e-mail: sales@elephantlifting.com

3.2 Main Components

In general, ELEPHANT LIFTING hoists consist of the following components:

- Motor
- Gearbox
- Top Block (with hook/lug/rigid trolley mount)
- Bottom Block (with hook/lug)
- Chain
- Chain container
- Control Valve (Hydraulic and Pneumatic hoists only)
- Hand Control (Hydraulic and Pneumatic hoists only)
- Hand chain (Chain block hoists only)
- Certain ELEPHANT LIFTING hoists can/must be coupled with trolleys.

In general, ELEPHANT LIFTING Trolleys consist of the following main components:

- Side plates with axles
- Rolling wheels
- Distance spacers
- Crossheads
- Motor/Drive for running geared wheels
- Gearbox
- Anti-drop plates

3.3 Product Description

ELEPHANT LIFTING hoists use a pneumatic, hydraulic, or manual power source to lift and lower loads. To do this the hoist is suspended from a rigid structure, by a top hook or lug.

To traverse loads, ELEPHANT LIFTING hoists can be suspended or built into ELEPHANT LIFTING trolleys.

The 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. Or that it is integrated into the structure of the trolley.

ELEPHANT LIFTING trolleys are moved according to their construction:

- Manual trolleys by pushing or pulling by hand (on hooks and/or load)
- hand chain trolleys by winding the hand chain
- Motorized trolleys by actuating the control of the traversing motor

Note: The track width of some ELEPHANT LIFTING 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.

ELEPHANT LIFTING trolleys are fitted with anti-lift and anti-drop devices.

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

Special ELEPHANT LIFTING hoist/trolley models can be delivered with:

- Extra low height for low headroom
- Rack-and-pinion drive for form-fitting power transmission
- Locking device for fixing in a certain position
- Two travel speeds
- Infinitely variable travel speed
- End switches for limiting the movement
- Increased spark protection 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

3.4 Technical specifications

Technical specifications, including specification drawings and exploded views are supplied by ELEPHANT LIFTING separately to this manual, and are available on request.

3.5 Intended use

In general ELEPHANT LIFTING Hoists are intended to be used exclusively for lifting and lowering loads within the specified load-carrying capacities with a vertical load chain.

When coupled with ATS trolleys ATS hoists can also be used for the horizontal movement of load above the floor within the specified load carrying capacities.

Any other use outside these stipulations is deemed to be impermissible. For applications requiring a different intended use please consider the ELEPHANT LIFTING range of winches and the ATS RIGGA range of hoists., ELEPHANT LIFTING cannot be held liable for any damage resulting from incorrect usage. The entire risk is borne by the operator.

The following situations, among others, are regarded as improper use:

- Exceeding the permitted load-carrying capacity.
- Oblique pulling or lifting of the load.
- Dropping, throwing and dragging the Hoist.
- Dragging, sliding, swinging and pulling the load.
- Catching of a falling load.
- Carrying people.
- Jog control over long distances.
- Switching to the opposite direction with load in motion.
- Operational reaching of the lifting and lowering limiters.
- Running against the end stopper or structure.
- Loading of the hook at the tip.

Intended use also includes observance of the operational manual and compliance with the inspection and maintenance conditions according to relevant standards, the ASME B30 set of standards is one such example.

NOTICE

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.

Under special safety provisions relevant to the situation, it may be possible for certain ELEPHANT LIFTING Hook and Lug mounted Hoists to be used for oblique pulling. Please contact ELEPHANT LIFTING in writing, if oblique pulling is required.

DANGER

Oblique pulling is not permitted for hoists installed in trolleys or in running gear unless specifically indicated on the hoist's nameplate.

The following model numbers of trolley hoist, and only these model numbers, are specifically designed to allow for oblique pulling:

- TSP10000RD+ TC
- ATSM-2/2RD + TC
- TS01000RD + TC
- TS02000RD + TC
- TS03000RD + TC
- TS05000RD + TC

DANGER

Oblique pulling results in substantially increased forces on the hoist, trolley, and trolley running beam. It is the duty of the responsible person, as described in section 2.3, to ensure that the running beam is able to safely support these increased forces prior to installation of the hoist. Please consult the document titled "ELEPHANT LIFTING Trolley Inclined Loading Information" for an indication of how the loads on the beam may be calculated. ELEPHANT LIFTING will not accept any responsibility for injury/damage of any kind caused due to failure to heed this notice.

3.6 Operating conditions

ELEPHANT LIFTING Hoists are extremely robust and require little maintenance. They are suitable for use in explosion-hazardous areas (see rating on hoist for details), as well as in areas with increased concentrations of soot and dust, high humidity and at ambient temperatures of -20°C (-4°F) up to approx. +70°C (+158°F) if they are not heated above this level due to external influences. The thermal endurance of chains and hooks is 150° C (302°F).

CAUTION

When touching metallic hand controls which are colder than 0°C (32°F), skin could freeze within a

few seconds, and at temperatures above 43°C (110°F), burns may occur. As a protective measure, please wear suitable gloves.

ELEPHANT LIFTING Hoists are not all suited to every operating environment, and some operating environments may require specific versions of ELEPHANT LIFTING hoists. If you are operating your hoist in extreme or safety critical environments such as:

- Critical Areas over nuclear plants.
- Over acid baths or other plants with corrosive substances.
- In areas in which organic acids are present.
- In explosive atmospheres (ATEX areas).
- Offshore

Ensure to check with ELEPHANT LIFTING in writing regarding the suitability of the hoist. It may be necessary to take certain precautions, such as reducing the nominal safe working load.

Please, consult your hoists Nameplate for information regarding ATEX rating. And contact ELEPHANT LIFTING in writing to determine the suitability of your specific version of hoist to your environment.
For stationary outdoor operation, hoists must be protected against weathering, and the maintenance intervals must be shortened.

WARNING

If the operating environment is extremely dusty the pendant hand control must be sealed inside a plastic bag, which prevents dust from contaminating it, when not in use.

3.7 Low Temperature Service

Under special conditions, ELEPHANT LIFTING hoists can be used in general service conditions down to temperatures of -30° C. Special attention is required in the following areas at temperatures below -15°C:

- Avoid shock loading – lift at a steady rate.
- Inspect bearings more regularly than those in normal service. Note that special lubrication may be required.
- Perform thorough visual inspections prior to each operation.
- Dress any surface damage (cracks, gouges, nicks) that may have occurs.
- Do not use air fittings that have been welded or modified.

3.8 System Pressures

ELEPHANT LIFTING Air/Hydraulic Hoists must always be operated at the nominal system pressure (see information on the nameplate).

WARNING

If the system pressure is too low, important functions of the hoist will be impaired, some such functions are:

- **The brake will drag and thus be subject to a high degree of wear. An impermissibly high degree of warming could take place.**
- **The controls become noticeably less sensitive.**
- **The load limiter may function erratically.**

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.

If the system pressure is too high dangers can include:

- **Overloading of the hoist, which could result in dropped loads, damage to the hoist's components (including residual damage which goes unnoticed), and damage to support structures.**
- **The load limiter may function erratically.**
- **Failure of pressure rated components, including hoses and fittings.**

3.9 Air hoist specific supply requirements

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

- Particle size less than 40 µm
- Particle density less than 10 mg/m³

(corresponds to Class 7 in accordance with ISO 8573-1:2001)
- Pressure dew point at least 10° C (20°F) below the lowest expected ambient temperature

A high capacity filter is required with 40-micron screening and should where possible include a water separator. Do not use tap water screens as they pass particles of between 0,25 - 0,50 mm which will cause excessive wear in the motor.

In order to provide adequate compressed air quality, operation with a service unit is recommended. It is a critical requirement that the compressed air supply is clean and dry.

A lubricator is not stringently required in the service unit if the above conditions are met. This allows the hoist to be run lube free, for example if used in a clean area. However, using a lubricator will prolong the life of the motor, protect against corrosion, and improve performance. Hence, it is recommended that a lubricator is used wherever possible.
Also see **Lubrication**, page 30.

DANGER

Do not operate ELEPHANT LIFTING Air Hoists with other gases. With moist air and ambient temperatures at or below 0°C (32°F), there is danger of icing in the motor.
Icing can be prevented by:
- **The use of an upstream air dryer or using a service unit with an oiler,**
- **Adding anti-icing agent to the lubrication oil (depending upon moisture content of compressed air),**
- **Or using air motor oil with anti-icing agent for relevant temperatures.**

WARNING

Always ensure a proper service unit, including a water extractor, and a FRLA (filter, regulator, lubricator assembly) is installed as near to the hoist motor as possible.

It is common for supply line air to be full of water, trash, and particulates. This is because the air leaves the compressor hot, and then cools as it travels down the supply line – creating condensation.

If this poor-quality air enters the motor, it can result in the vanes swelling and the motor seizing.

See Section 17 for further information.

3.10 Hydraulic hoist specific supply requirements

To maintain the maximum efficiency, and proper performance, of ELEPHANT LIFTING Hydraulic Hoists ensure that appropriate diameter hoses are used; based on the flow rate requirements of the hoist and the length of said hoses. Using smaller hoses than required may cause excessive back pressure on the system, as well as generate excessive pressure losses in the hose. This could lead to a variety of problems some of which are outlined in Section 3.8.

The most frequent cause of malfunction or failure of hydraulic equipment is the presence of contaminants in the hydraulic fluid. ELEPHANT LIFTING Hydraulic Hoists perform best with a minimum cleanliness specified in accordance with ISO 4406:1999; 4µm/6µm/14µm of 19/17/14.

The level of contaminants in the fluid can be reduced by ensuring effective filtration and by replacing hydraulic fluid before it fully deteriorates. Some indications of deterioration are:

- A major change in colour or noticeable thickening of the fluid. This indicates a major deterioration.
- A milky discoloration would point towards the possible presence of water contamination.
- Foaming and aeration, which may indicate leaks, faulty connections, or a low oil level in the hydraulic tank.

ISO VG 30, 46 and 68 oils will give good results under normal operating conditions. A high viscosity index will minimize changes in viscosity with changes in temperature, and will ensure more consistent operation. Always use a premium anti-ware “AW” grade of oil in your system.

Filters should be equipped with clogging indicators which should be checked daily. Replace filter if indicators show filter is blocked. No more than 0,5 bar pressure drop is permissible across return filtration. It is also recommended that filters be changed if hydraulic oil is changed, or a major component (pump, valve, motor, etc) is repaired or replaced.

When ELEPHANT LIFTING Hydraulic Hoists are installed with their own hydraulic system, or when there is no filter in an existing circuit, a partial flow microfilter should be installed between the control valve and the reservoir. This filter should be rated at Beta 200=6µm. Filters must include an integral 2 bar bypass check valve which will open when the filter is filled to 80% capacity.

The pump used with the hydraulic system must be capable of producing the required pressure and volumetric flow rate as required by the product. Failure to achieve this will result in erratic behaviour as outlined in Section 3.8, and poor system productivity.

This hydraulic hoist requires a dedicated case drain line, the pressure on this line must not exceed 2 bar.

The presence of hot hydraulic fluid in a hydraulic system is another primary cause of poor operation, component failure, and system downtime. The fluid used in any hydraulic system is formulated for operation within a temperature range of 0°C to 60°C (32°F-140°F). If the temperature is frequently exceeded component, oil, and system operation will be degraded. Under continuous operating conditions the temperature of the oil at any given point in the hydraulic system should not be allowed to exceed 80°C (176°F)

3.11 Chain block hoist specific requirements

WARNING

Chain block hoists are designed to require a pulling load of 55 to 110 lb (25 to 50 kg) on the hand chain, if higher values than this are required it is likely that overloading has occurred, or the hoist is otherwise out of working order. If the hand chain becomes difficult to pull the assistance of a competent person, as described in Section 2.3 should be sought.

The hand chain of ELEPHANT LIFTING chain block hoists should never be overloaded. The following is a list of some behaviours that constitute misuse:

- Pulling on the chain at an angle rather than vertically.
- Pulling on the chain with a non- manual power source, e.g. a weight.
- Hanging on the load chain.

4 TRANSPORT AND STORAGE

4.1 Safe Transportation

If you wish to dismount or transport your Hoist to another site or for inspection, take note of the following points:

- Carefully dismount trolley from the beam (if fitted).

- Set the entire hoist down carefully; do not allow it to drop. For hoist weight see technical spec sheet for your specific hoist.
- Ensure outcropping features (such as levers) are not damaged by the weight of the hoist.
- Lay control and supply hoses together in such a way that they are not kinked.
- Please ensure that the controls are not damaged. (Risk of malfunction).
- Reel in the hoist chain in such a way that loops cannot form and the chain cannot become twisted.
- Secure the chain.

4.2 Breaks in operation

- In the case of longer operational breaks, coat the chain, hook, hook latch, and hook pins with a light oil film.
- Always keep the hoist in a no-load condition when not in active use.
- Wipe off all dirt and water.
- Before returning the hoist to service, follow instructions for hoists not in regular service in Section 8.3.

4.3 Air Hoist Motor Lubrication Requirements

- If the hoist is to experience an extensive operational break, spray anti corrosion spray or SAE 10W or 27-32 centistoke oil into the air inlet port and run the hoist slowly for a few seconds. This will coat the motor internals and prevent mechanical components from seizing.
- Plug hoist air inlet port to prevent ingress of contaminants.

WARNING

Failure to properly treat the motor with an appropriate lubricant prior to an operational break could lead to seizing or other damage.

4.4 Storage

- Store the hoist in a clean dry and non-corrosive environment.
- Before returning the hoist to service, follow instructions for hoists not in regular service in Section 8.3.

5 INSTALLATION AND INITIAL OPERATION

The installation of ELEPHANT LIFTING Hoists shall be performed by a qualified person as described in Section 2.3. Prior to installing the product, carefully inspect it for possible shipping damage. Products are generally supplied fully lubricated from the factory, however, one notable exception to this is the chain.

The chain on ELEPHANT LIFTING hoists must always be lubricated following the instructions outlined in Section 9, failure to do so could result in premature wear and failure of the chain.

The second notable exception is the worm drive gearbox (if fitted). The gearbox is shipped empty and must be filled with oil before use. See lubrication instructions in Section 9.

DANGER

Owners and users are advised that regional requirements may apply. It is the duty of the responsible person as described in Section 2.3 to examine specific local or other regulations. In the USA these may include American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers (ASME) and/or OSHA regulations. In the EU these may include the EC Machinery Directive 20006/42/EC, including relevant requirements for CE marking. In China these may include requirements set out by the China Classification Society (CCS). In South Africa these may include requirements set out by the South African Bureau of Standards (SABS).

CAUTION

Always take account of the weight of the hoist when handling it, an indication of the weight of the hoist can be found in the hoist specification sheet, however, the actual weight should be measured.

5.1 Mounting

Always make certain the hoist is properly installed, by:

- Ensuring that the structure/s and component/s to which the hoist is mounted is strong enough to support the entire load placed upon it. This must include the weight of the hoist, the weight of the load being lifted, all rigging equipment, as well as a generous safety factor of not less than 500% of the combined weights.

- Ensuring that the supporting structure forms a rigid mounting. Vibration damages the chain and can lead to chain fracture. Furthermore, external vibration must not be transmitted to the hoist.
- Provide a suitable safe working platform for the mounting personnel.
- Please supply adequate working tools and ensure they cannot be dropped.

5.1.1 Hook Mounted Hoist

- If the hoist is suspended by a top hook the supporting member must rest completely within the saddle of the hook, and be centred directly above the hook shank. Do not use a supporting member which tilts the hoist.
- Always ensure that the hook latch closes automatically and fully.

DANGER

Do not drop lifting equipment; equipment should always be placed properly onto the floor. And should be supported by appropriate means during mounting.

5.1.2 Trolley mounted hoist

DANGER

ELEPHANT LIFTING trolleys must only be installed by qualified personnel as described in section 2.3. Faulty installation can lead to serious accidents.

DANGER

The trolley girders for ELEPHANT LIFTING trolleys must be able to safely withstand the expected

DANGER

forces.

The trolley girders for ELEPHANT LIFTING trolley mounted hoists must be level and rigidly supported. If the girder is more than 1,5 degrees skew (as measured on the bottom flange), or non-rigidly supported, load chain damage will occur. This will lead to increased chain wear, and possibly chain failure. See section 3.5 relating to oblique pulling.

DANGER

Suitable end stops must ALWAYS be installed on the girder beam to prevent the hoist from travelling over the end of the beam. Failure to do so could result in dropped load.

The rated capacity of the suspended/built-in hoist must not be larger than the rated capacity of the trolley.

Dynamic tractive forces must be considered.
ELEPHANT LIFTING trolleys are designed for girder profiles in accordance with DIN 102 or similar profiles.

There must be sufficient room for the trolley to move freely along the entire length of the track. For example, there should be no screw heads, clamping plates, web plates or other similar obstructions 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.

The control hoses on the motor side leading to the control valve should only be connected after having mounted the trolley to avoid damage see section 5.2.

5.1.3 Mounting Motorised Trolleys or Monorail Hoists

For adjustable trolleys and hoists, the wheel spacing, and bottom block width need to be set prior to mounting the hoist/trolley on the beam. The crossheads with adjustment will have washers and bushings that allow for fine enough adjustment of the spacing. By adding or removing washers from both sides (and fitting "spares" on the outside of the trolley/bottom block), set the hoist to allow 1 to 1.5mm (3/64" to 4/64") between the wheel flange and the beam flange. See girder below. Where adjustable bottom blocks are used, apply the same method to allow 1 to 1.5mm (3/64" to 4/64") clearance on the bottom block inner member to the beam flange. Ensure that all lock nuts or end caps are properly secured before using the hoist/trolley. In addition, it is vitally important that the trolley is assembled such that all spacers are arranged symmetrically about the center line of the beam web (shown in red in Figure 1 below), and that any load applied to the trolley falls on this center line.

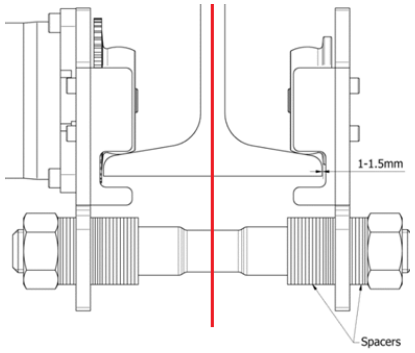


Figure 1: Trolley mounted on girder

5.1.4 Mounting Trolleys with Load Bolt into Girders with Open Ends

- Pre-adjust the width of the trolley side plates by adding or removing spacers between the side plates until the distance between the wheel flanges is 2-3mm (5/64” to 1/8”) wider than the bottom girder flange as explained in section 5.1.3.
- Push the trolley onto the girder on the open end, with the wheels running on the top face of the bottom flange. For trolleys with a rack and pinion drive, the pinion must be lowered and disengaged from the rack during mounting.
- Make sure there is a 1-1,5mm (3/64” to 4/64”) gap on each side between the edge of the bottom girder flange and the wheel flange.
- Engage the drive pinion onto the rack (if fitted) See section 5.4.

5.1.5 Mounting Trolleys with Load Bolt into Girders with Closed Ends

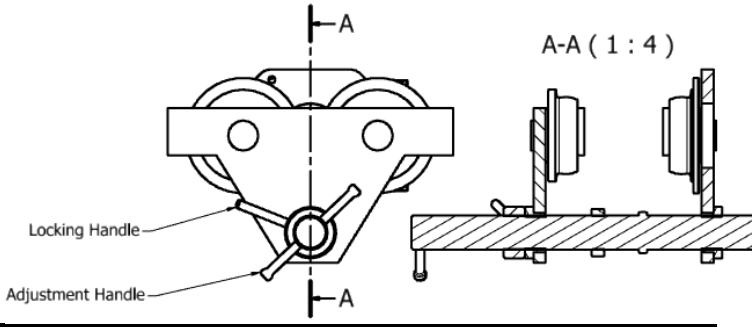
- Pre-adjust the width of the trolley side plates by adding or removing spacers between the side plates until the distance between the wheel flanges is 2-3mm(5/64” to 1/8”) wider than the bottom girder flange as explained in section 5.1.3.
-
- The hexagonal nuts must be loosened as far as possible, until all four wheels are able to pass over the bottom flange of the girder (it may be necessary to remove the side plate entirely).
- Insert the first two wheels on one side plate into the girder and rest them on the top face of the bottom flange. For trolleys with a rack and pinion drive, the pinion must be lowered and disengaged from the rack during mounting.
- Insert the second pair of wheels into the girder, so that they run on the top face of the bottom girder flange.
- Re-tighten the nuts on the side plate, an ensure that section 5.1.3 is complied with.
- Engage the drive pinion (if fitted) see section 5.4
- By screwing the threaded load bar using the adjustment handle, adjust the width of the trolley until the distance between the wheel flanges is 2 – 3mm (5/64” to 1/8”) wider than the bottom girder flange.
- Lock the threaded load bar in place by tightening the locking handle.
- Push the trolley onto the girder on the open end, with the wheels running on the top face of the bottom flange.
- After mounting, the clearance between the outer edge of the girder bottom flange and the wheel flange should be 1-1,5mm (3/64” to 4/64”).

5.1.6 Mounting Trolleys with threaded Load Bar into Girders with Closed Ends

The locking handle and adjustment handle are shown in Figure 2.

- Pre-adjust the width of the trolley by screwing the threaded load bar using the adjustment handle. Adjust the width of the trolley until the distance between the wheels is 2-3mm (5/64” to 1/8”) wider than the bottom girder flange.
- Pass all four wheels over the bottom flange.
- Insert the first two wheels on one side plate into the girder and rest them on the top face of the bottom flange.
- Narrow the distance between the side plates until the second pair of wheels are also inserted into the girder and rested on the top face of the bottom flange.
- Adjust the width between the wheels until there is 1-1,5mm (3/64” to 4/64”) gap on each side between the edge of the bottom girder flange and the wheel flange.

Figure 2: Threaded load bar with adjustment handles



- Lock the threaded load bar in place by tightening the locking handle.

DANGER

At the largest girder width, the threaded load bar must be at least flush with the side plate on the outside.

After mounting please check the following

- The clearance between the outer edge of the girder flange and the wheel flange. It should 1-1,5mm (3/64" to 4/64") on either side.
- The position of the anti-tipping device (If installed). It should have a clearance of approx. 1mm (3/64") to the underside of the girder.
- The fit and position of the end stops on the girder.

5.2 Connecting the controls

If the control device is delivered separately the control hoses need to be attached to the correct ports on the hoist/trolley valve before operation.

WARNING

If the operating environment is extremely dusty the control must be sealed inside a plastic bag, which prevents dust from contaminating it, when not in use.

5.2.1 Connecting pneumatic control hoses

Pilot line E-stop

For Hoists fitted with a pilot line E-stop the pilot hoses must be attached to the appropriate control ports as shown in Figure 3.

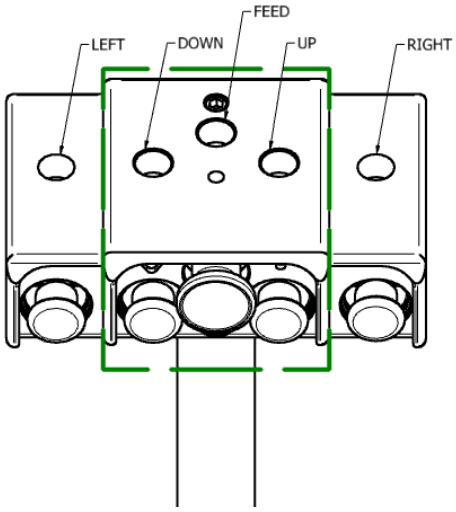


Figure 3: Pendant control with Pilot Line E-stop

ELEPHANT LIFTING hoists are fitted standard with BSP threaded hose fittings. They are attached by tightening the female nut over the male adaptor.

FEED: attach to S3 port on **hoist** valve.
LEFT: attach to appropriate port on **trolley** valve (S1/2).
RIGHT: attach to appropriate port on **trolley** valve (S1/2).
UP: attach to appropriate port on **hoist** valve((S1/2).
DOWN: attach to appropriate port on **hoist** valve(S1/2)

NOTICE

The pilot control for an air hoist without an air motor driven trolley will only have the ports inside the dotted green square in Figure 3 and Figure 4.

Mainline E-stop

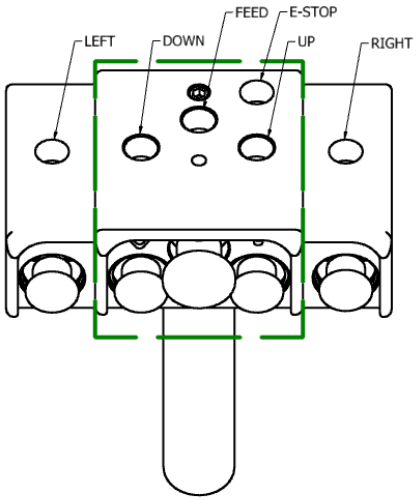


Figure 4: Pendant control with Mainline E-stop

The mainline E-stop has an additional E-stop port as shown in Figure 4.

FEED: attach to the external E-stop solenoid valve.
E-STOP: attach to the external E-stop solenoid valve.

DANGER

Once the hand control is connected to the hoist, it must be verified by the responsible person, under a no-load condition; that the hoist moves in the expected directions based on the arrows on the pendant control; that movement ceases when the control buttons are released; and that the E-stop button functions as described in section 6.3.1. If unexpected movement of any type occurs, the pendant control may have been incorrectly connected and connections must be rectified.

WARNING

Do not attempt to connect or disconnect the control hoses to the hoist with the system pressurized or under load. The hoist could exhibit unexpected behavior. Note that the system will remain pressurized even after the main air supply is shut off.

Determining the "Appropriate" valve ports

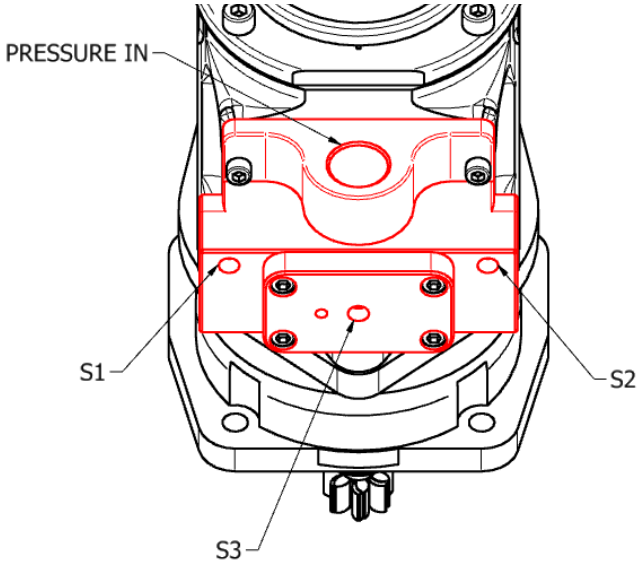


Figure 5: Pilot valve ports

ELEPHANT LIFTING Pilot valve blocks have three pilot ports as shown in Figure 5.

S1: Signal in 1
S2: Signal in 2
S3: Signal Out

Inputting a signal into S1 will cause the motor to turn in one direction, inputting into S2 will cause the motor to turn in the opposite direction.

If depressing a button on the hand control results in the opposite function to what is required, the hoses on ports S1 and S2 must be switched so that the correct function occurs. (e.g. If pressing the up button results in a down movement, the hoses must be switched to opposite ports).

WARNING

Only use genuine ELEPHANT LIFTING Pendant controls with ELEPHANT LIFTING hoists/trolleys.

WARNING

Using other controls violates the intended use of the hoist/trolley. And could lead to unpredictable consequences. Including but not limited to damage to the valve block or motor.
Attempting to retrofit a non -variable ELEPHANT LIFTING valve block with an ELEPHANT LIFTING variable pendant control could lead to unexpected behavior or damage to the hoist. Contact ELEPHANT LIFTING for further information should you require variability on your hoist.

5.2.2 Connecting the main air supply

- Check air connection for contamination and clean if necessary.
- Blow through compressed air hose in order to remove foreign bodies.
- Spray a small amount of airline lubricant directly into the supply hose.
- Attach the compressed air hose to the PRESSURE IN port on the hoist or on the service unit. Tighten the union nut.

See table below for minimum hose internal diameters:

Hoist Model	Minimum Hose Size
Compact hoists (0.5t-1t)	13mm
Indu hoists (0.5t-1t)	13mm
Indu hoists (2t-20t)	19mm
High-capacity hoists (25t-75t)	38mm

5.2.3 Connecting hydraulic control hoses

ATS hydraulic hoists are generally supplied with control hoses attached. Please contact ELEPHANT LIFTING directly for further instructions relating to your specific hydraulic hoist if required.

5.2.4 Connecting the main hydraulic supply

- Ensure that the points outlined in section 3.10 are followed.
- Ensure hydraulic connections are free from dirt or debris.
- Make sure the that the hydraulic motor and case drain line (if fitted) are filled with hydraulic fluid to ensure proper lubrication.
- Connect tank, pressure, and return lines to hydraulic supply.
- Turn on the hydraulic supply.
- Ensure that no leakage occurs on any fittings.
- The hoist may exhibit unexpected behavior (such as shuddering, or stalling) if the hydraulic system is not properly filled with oil due to air trapped in the system. If necessary, bleed the system to stop this

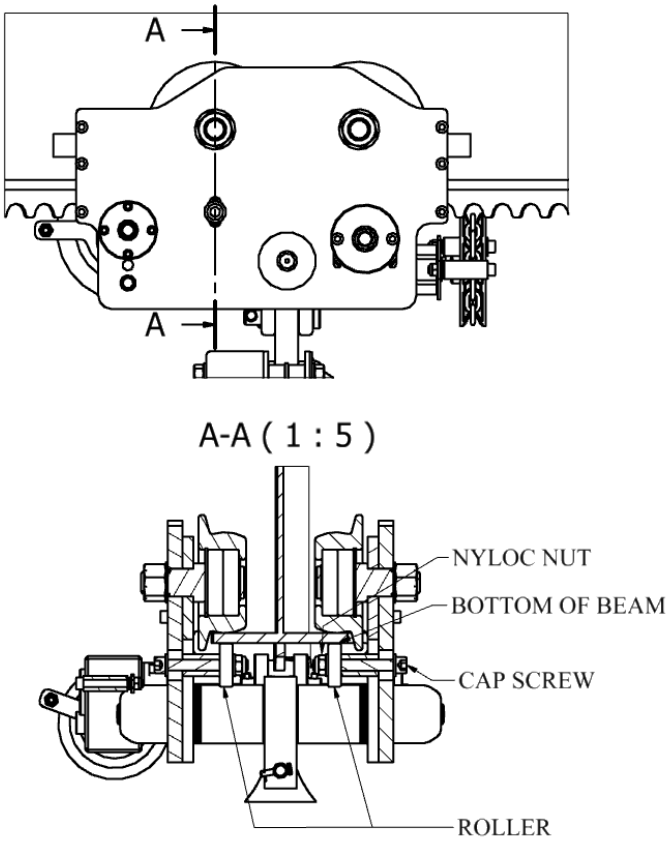
behavior. Do not operate a hoist which is exhibiting unexpected behavior of any kind.

5.2.5 Wireless or other non-standard controls

Contact ELEPHANT LIFTING for specific instructions

5.3 Setting the Anti-Tip rollers

Some ATS trolleys, particularly those designed for oblique loading, are fitted with Anti-Tip rollers, which prevent the trolley from tipping on the beam. These rollers must be positioned, and securely fastened, 1-2 mm below bottom face of the bottom beam flange during installation.



WARNING

Hoists are shipped with the Anti-tip rollers in an unfastened condition. Failure to properly position and tension anti-tip rollers could lead to the hoist tipping on the beam.

5.4 Adjusting the Rack Drive

Some ATS trolleys are fitted with a rack drive. The trolley should be mounted onto the beam with the rack drive disengaged. Once the trolley is mounted on the beam, drive must be engaged.

The engagement between the rack and drive can be adjusted by loosening the retaining bolts on the gearbox and sliding the trolley gearbox up or down. This allows for proper engagement of the rack drive. It also offers the option of disengaging the rack drive, so that the trolley can be moved down the beam freely if necessary.

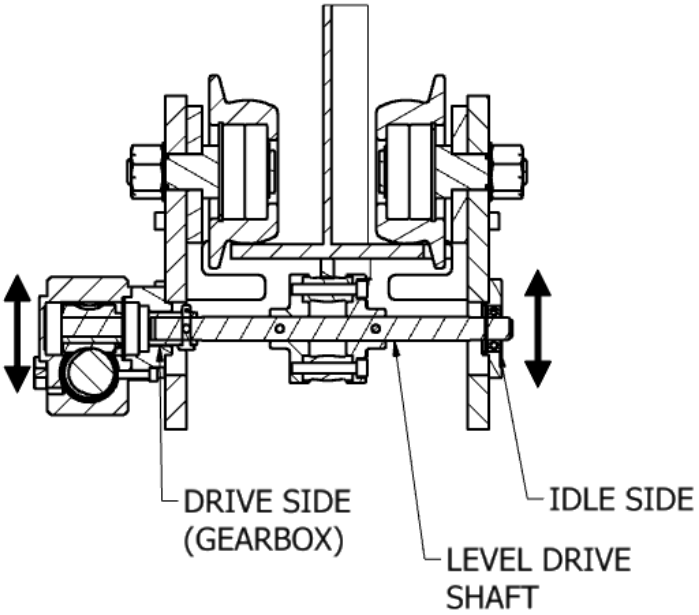
If there is more than one drive on a running gear, one drive must be engaged first. To engage additional drives, the pinion must be brought into a suitable position with respect to the rack. Afterwards, the engagement is to be adjusted.

5.4.1 Rack and pinion drives

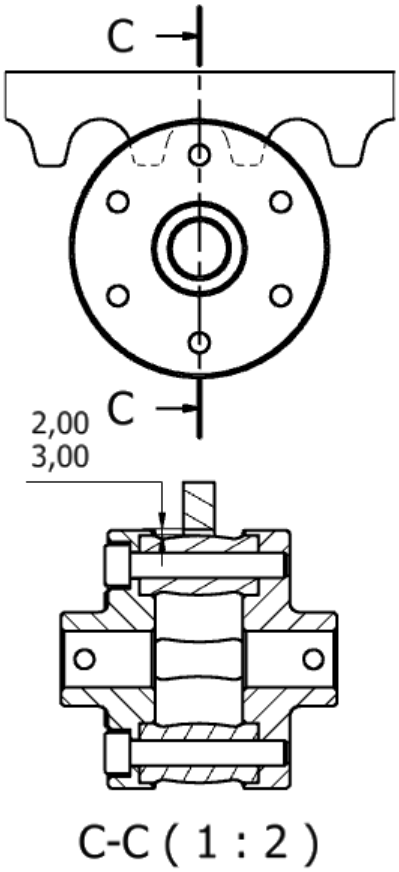
For trolleys with rack-and-pinion drives, sufficient flank clearance (approx. 0.3mm or 1/64”) must be set between the drive pinion and the rack, along the entire track. If the setting is too close, the drive pinion could be damaged or even break.

5.4.2 Rack and Pin drives

For trolleys with pin drives. The drive should be set such that there is approximately 2mm of clearance between the outside of the thickest section of the pin, and the root of the rack along the entire track. When the pin is

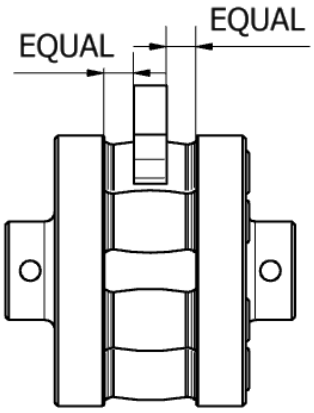


in the top dead centre position. As shown below.



In addition, particularly with curved beams, it must be ensured that the sits roughly in the centre of the pin drive. As shown below.

DANGER



5.4.3 Trolleys with a rack at centre of beam

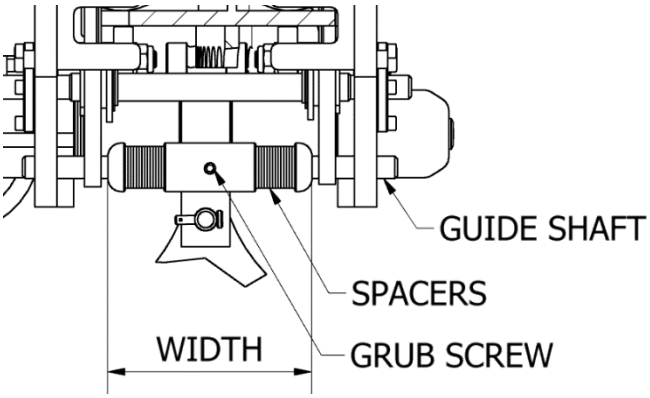
If the rack is located at the centre of the beam, it is driven by a trolley drive shaft supported on both ends by the side plate assemblies. The drive shaft must be level. As shown below.

This can be achieved by loosening the bolts on both the drive and idle side. Positioning the drive side in the correct position, locking the drive-in place, and then positioning the idle side such that the drive shaft is level and locking it in place. The drive engagement can then be checked. If any further adjustment is required to achieve proper drive engagement, both sides of the drive shaft should always be raised/lowered by equal amounts.

5.5 Setting the track clamp

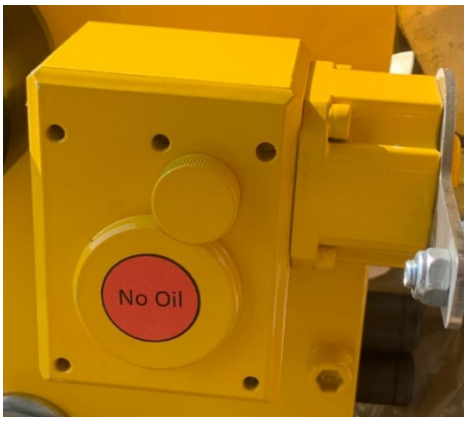
Track clamps are factory set at a width to match the beam specified in the order. Should the trolley be mounted on a different width beam. The track clamp must be set to the appropriate width for the beam onto which the hoist is mounted. This is achieved by adding or removing spacers from the guide shaft until the overall width shown below is 2-5mm narrower than the bottom flange of the beam.

Spacers are added or removed by first loosening the grub screw, then retracting the guide shaft. **Not every beam size can be accommodated by the track clamp, contact ELEPHANT LIFTING for specific advice is mounting your trolley on a beam different to that originally specified in the order.**



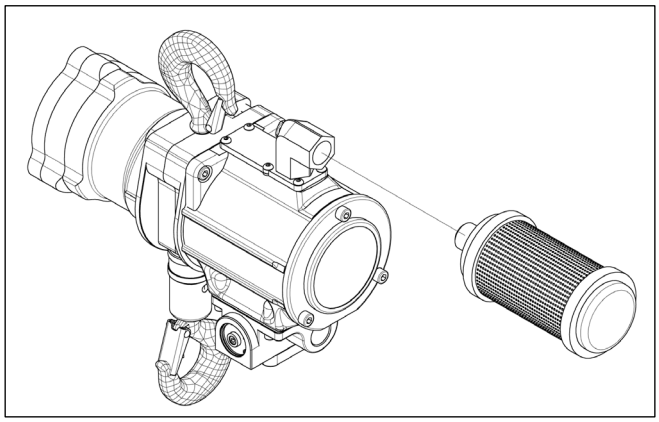
5.6 Oiling the worm drive gearbox

The worm drive gearbox (if fitted) is supplied in a non-lubricated condition. It must be oiled before use. See section 9.



5.6B Remote Muffler Installation (2t & below)

ATS Pneumatic hoists are supplied with an exhaust muffler. The figure below shows where to install the muffler:



Note that the thread on the muffler is tapered and should not be over-tightened. It is recommended that PTFE thread tape be used to form a seal.

5.7 Inspection Before Initial Operation

Hoists mounted into trolleys must comply with the regulations for the prevention of accidents valid for cranes. Before beginning to use a hoist 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.

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

- ELEPHANT air hoists are to be tested dynamically. This is because you get to see how the hoist dynamically responds to the load and allows you to confirm that the hoist runs smoothly under load. The chances of shock loading the hoist is minimized as the load is free to move up and down. It is important to note that even while load testing a hoist dynamically, it is important to slowly take up the slack in the chain. This is to ensure the chain and gearbox are not shocked by the sudden tensioning of the chain. Neither the chain nor the hoist are designed for these kinds of shocks and can lead to premature failure of both components.
- When testing the brake, visually inspect if the brake is holding or not. If the load is moving downward then the brake is not holding. Dynamic testing is performed with 1.1 times the maximum carrying capacity under normal working conditions (lift load just above floor).

WARNING

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

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

Hoists in trolleys do not represent a ready-to-use installation on delivery; the manufacturer only supplies a declaration of incorporation. EC conformity cannot be issued until the ready-to-operate installation has been checked by an authorized person.

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 ELEPHANT LIFTING.

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.

5.8 Checking prior to initial Operation

Hoists are tested for proper operation prior to leaving the factory, however, all functionality shall be checked on site following initial installation prior to placing the hoist into operation.

Hoists, including the supporting structure, must be inspected by an appropriately trained and qualified person as described in Section 2.3 before initial operation and before re-commissioning after significant modifications. Hoists and lifting gear which are installed in trolleys must be inspected by a specialist.

The inspection covers:

- The proper mounting, equipment level and operational readiness.
- The completeness, suitability, operation, and effectiveness of the safety devices
- The condition of the device, the harness, the equipment and the supporting structure.
- After installation, ensuring the clevis or hook is centered below the beam
- Verify that all components are appropriately lubricated (including the chain).
- When first operating the hoist, it is recommended that the hoist be driven slowly in each direction for a few minutes.
- Check for leaks in the system.
- Check that trolley, or clevis, or hook movement is the same direction as arrows or information on the controls.
- If hoist is trolley mounted operate the trolley along the entire length of the beam.
- Using a light load on the hoist check operation of hoist and trolley brakes.

- Check hoist and trolley (if applicable) performance when raising, moving and lowering test loads. Hoist and trolley must operate smoothly and at rated specifications prior to being placed in service.
- Check all safety devices are functional.

NOTICE

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

6 OPERATION

DANGER

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. Operators must be physically competent. Operators must have no health condition which might affect their ability to act, and they must have good hearing, vision and depth perception. The hoist operator must be carefully instructed in his duties and must understand the operation of the hoist, including a study of manufacturer's literature. The operator must thoroughly understand proper methods of hitching loads and should have a good attitude regarding safety. It is the operator's responsibility to refuse to operate the hoist under unsafe conditions.

6.1 General operating requirements

The most important aspects of hoist operation are:

- Follow all safety instructions when operating hoist.
- Allow only people trained in safety and operation of this product to operate this equipment.
- Subject each hoist to a regular inspection and maintenance as outlined in this manual under section 8.
- Be aware of the hoist capacity and weight of load at all times.
- Hoists may only be operated by persons charged with this task by their company.
- Before using the hoist for the first time, familiarize yourself with all permissible operating conditions. For this purpose, read through this operation manual thoroughly and perform the described actions on the hoist.
- Report any malfunction to your safety officer immediately, so that the fault can be remedied without delay.
- Adhere to the regulations of the relevant accident prevention authorities.

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

- Lift the load carefully at the beginning.
- Never touch a running chain.
- Never wind the Load Chain around the load or attach the load directly using the Load Chain.
- Never use grab hooks on the load chain.
- Never allow loads to fall into the hoist chain
- If the chain is slack, do not take up the load at maximum speed.
- When operating without a chain box, avoid hazards due to idle chain (falling, catching, impacting).
- Never apply bending loads to chains.
- Do not join or repair hoist chains.
- Do not operate with a chain which is drawn tight, bent or extended.
- Check blocked chains for damage.
- Straighten twisted chains (defective bottom block)
- Do not operate with damaged or worn or rusty chains.
- Permissible operating temperature for chain and hook: -20°C (-4°F) to +150°C(+302°F); permissible ambient temperature: -20°C(-4°F) to +70°C (+158°F); permissible heat absorption of the hoist body: max. 90° C (194°F).
- 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.
- Ensure that the operator is not put at risk within the operating area by attaching aids or the load.
- Follow the relevant instructions for attaching loads.
- Before attaching, accurately position the load vertically below the hoist. The chain must hang vertically before lifting.
- Ensure that the hook safety catch is closed.
- Before lifting loads, ensure that the maximum permissible load is not exceeded.
- Attaching aids must be included in the weight of the load.
- When taking up and setting down, ensure stable positioning of the load, to prevent accidents due to tilting or falling loads.
- Never drive against jammed loads.
- Only use original ELEPHANT LIFTING chain boxes.
- Ensure that chain enters the chain box smoothly, and that it isn't bunching up.
- Only lift one load at a time; never several loads simultaneously.
- Never lock the control elements of control devices.
- In the case of stiff actuating elements, have the hoist repaired.

- In the case of power failure, secure the load and the surrounding area, until the power is restored.
- Never use or repair bent, open or deformed load hooks. The hoist must be repaired, and the hook must be replaced.
- Never anneal the hook.
- Only operate ELEPHANT LIFTING Hoists with original ELEPHANT LIFTING controls.
- Uncontrolled, external force factors (such as due to hydraulic cylinders, falling loads) are not permitted.
- Repair damaged hook safety catches.
- Repair stiff hook bearings.
- Do not kink or pinch control hoses.
- Have loose bolted connections tightened by the Repairs department, in accordance with section 11.
- Before removing compressed air hoses, shut off the main air supply.
- Do not exceed the permissible capacity of the chain box.
- Repair the hoist if the braking distance is excessive.
- If a load is lifted using several air hoists, prevent overloading due to incorrect weight distribution.
- Select a safe operating location.
- Ensure the correct system pressure.
- Never touch metallic hand controls which are colder than 0°C(32°F) or hotter than 43°C(110°F), without suitable protective gloves.
- Do not make modifications to the hoist.
- Only use original ELEPHANT LIFTING spare parts. ELEPHANT LIFTING 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.
- All inspections must be completed as per Section 8.
- If a trolley is used ensure stops are securely installed at both ends of the beam prior to using Trolley. This is to prevent the Trolley from running off either of the open ends of the beam track.
- Keep the load as close to the floor as practical; to make people aware and keep clear of the Trolley path.
- Ensure that Trolley wheels' ride on the top surface of the lower flange of the beam. And that this surface is level.
- Special safety precautions must be taken when lifting loads into areas which are out of sight.

WARNING

For all 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. Failure to do this presents a danger due to overloading.

DANGER

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

DANGER

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

WARNING

If the operating environment is extremely dusty the pendant hand control must be sealed inside a plastic bag, which prevents dust from contaminating it, when not in use.

6.2 Company specific Operating instructions

In the case of particularly difficult lifting equipment applications, for example if several hoists/trolleys are working together, the user must set up the conditions for safe operation. If the local conditions, or the work to be performed make it necessary, the user shall define operating instructions in the language of the operator within, among others, the framework of this manual.

6.3 Controls

6.3.1 Pilot Pendant Controls

The hoist is operated via a two-button pilot pendent control. The two buttons control the lifting and lowering of the hoist. For hoists mounted on motorized trolleys a four-button pilot pendent control is supplied which controls the horizontal movement of the trolley in addition to the lifting and lowering of the hoist. The control has arrows indicating the direction of movement of the lower hook and the trolley. When the buttons are released, the control valve shuts off the air supply to the hoist thereby applying the brake and stopping the hoist.

Variable Control

At request, hoists can be optionally supplied with infinitely variable pilot control levers. The infinitely variable pendent control allows for precise spotting and variable speed control. The harder the pendent levers are pressed the faster the hoist or trolley will operate.

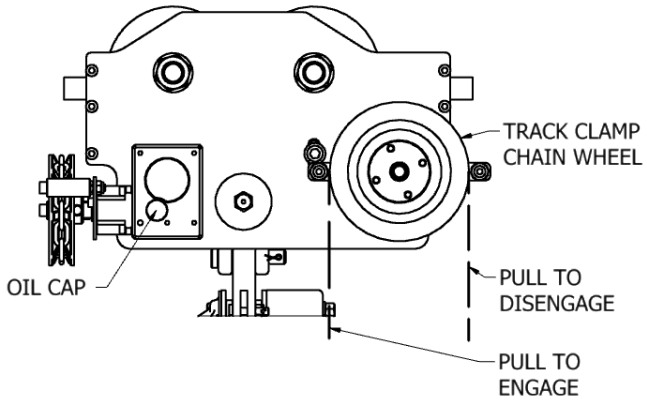
Emergency Stop

The emergency stop button, when pressed, detents 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, pull out the emergency stop button hard to release it.

6.4 Using the track clamp brake (if fitted)

Some ELEPHANT LIFTING trolleys are fitted with a track clamp brake, the track clamps function is to be a "park" brake for the trolley when not travelling (for example when attaching/detaching loads). The track clamp is engaged by rotating the chain wheel in the anti-clockwise direction, and disengaged by rotating the chain wheel in the clockwise direction. This is achieved by pulling down firmly on the appropriate chain.



DANGER

The level of clamping force applied by the track clamp is proportional to the force applied to the chain. Always ensure the chain wheel is fully tightened in order to achieve maximum clamping force.

CAUTION

Always ensure the track clamp is fully disengaged before attempting to traverse the trolley along the beam. Premature wear of the track clamp brake pads may occur if this notice is ignored.

7 TAKING OUT OF OPERATION

7.1 Shutting Down

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

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

Make sure to follow the storage and transport instructions specified in Section 4.

7.2 Dismantling

DANGER

Disassembling a Trolley Hoist from the beam by separating the side Plate Assembly is extremely dangerous and this operation should be carried out by competent personnel. As outlined in Section 2.3.

DANGER

Exploded views are available from ELEPHANT LIFTING on request and must be obtained before attempting to dismantle the hoist. Incorrectly assembling, or disassembling, a hoist could lead to hoist failure.

ELEPHANT LIFTING Air Hoists must only be dismantled by qualified personnel.

WARNING

Disconnect the air supply hose before performing any maintenance or repairs on this hoist.

- Check fault list for problem solving.
- Do not disassemble the hoist any further than necessary to replace or repair damaged parts, unless major service is due.
- Whenever grasping a component in a vice, always use aluminum covered or copper covered vice jaws to protect the surface of the component and help prevent damage. This is particularly true of threaded members and housings.
- Do not disassemble this hoist unless you have a complete set of new gaskets, O-rings and seals on hand for replacement. These are available in the Overhaul Seal and Gasket Kit and parts list.
- Do not attempt to recondition by washing out sealed bearings. We recommend that all bearing, vanes & O-rings be replaced when the hoist is reassembled.

7.3 Dismantling of the Control Valve (Pilot Pendent Control)

- If the hoist has a pendent control, remove the three pendent control hoses.

- Unscrew the four bolts attaching the control valve to the motor housing. Remove the control valve from the hoist. Remove the gasket.
- Examine all components for wear, replacing damaged or worn components. Replace all gaskets and O-rings before re-assembly.
- Remove all sharp edges and burrs from components. Wipe all components with SAE 10W oil before re-assembling in the reverse order to stripping.

7.4 Disposal

ELEPHANT LIFTING 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
- Plastics
  - Polyethylene
  - Polyurethane
  - Polyamide
  - Natural rubber
  - Epoxy resin
  - Polyacetal
  - Thermoset moulding compound
  - (Asbestos-free brake lining)

Filter Silencer/Service Unit:

- Zinc die cast
- Brass
- Nitrile rubber
- Aluminium
- Polypropylene
- Polyurethane
- Glass-fibre reinforced plastic
- Steel
- Polyacetal
- Polythylene

8 MAINTENANCE AND INSPECTION

Careful inspection on a regular basis will reveal potentially dangerous conditions while still in the early stages, allowing corrective actions to be taken before the condition becomes dangerous.

Any malfunction, damage or deficiency revealed through inspection must be reported to an appointed person. A decision must be made as to whether a deficiency constitutes a safety hazard before resuming operation of the hoist.

Maintenance and inspection work may only be performed once the responsible person in charge is convinced that the trolley and the hoist is cut off from the energy supply and that measures have been taken to prevent the unauthorized re-supply of energy.

If there is a danger that parts may fall down, the corresponding area has to be barricaded and protected by guards. Other risks from neighboring installations also have to be safeguarded against. After completion of the work, operation may only recommence following release by the responsible person. Before release, the operator must be convinced that all work has been completed, that the entire system is in a safe condition again, and that all personnel involved have cleared the installation as appropriate.

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

ELEPHANT LIFTING recommends two types of inspection:

(a) The frequent inspection performed by the operator as pre-work inspection.
(b) The periodic inspections performed by personnel trained in the operation and repair of the Hoist.

8.1 Frequent Inspection

On hoists in continuous service, frequent inspection should be made at the beginning of each shift. In addition, visual inspections should be conducted during regular service for any damage or evidence of malfunction. Inspection frequency shall be as below.

USEAGE	NORMAL	HEAVY	SEVERE
INSPECTION FREQUENCY	MONTHLY	WEEKLY TO MONTHLY	DAILY TO WEEKLY

8.1.1 Operation.

Check for visual signs or abnormal noises (grinding etc.) which could indicate a potential problem. Make sure all controls function properly and return to neutral when released. Additionally, ensure that the chain and motor do not “run on” and that the brake activates when the control is released. Check chain feed through the chain guides, sprockets, and bottom block. If chain

jams, wedges, jumps, is excessively noisy or “clicks”, clean and lubricate the chain. If problem persists, replace the chain sprockets or chain guide. Do not operate the hoist until all problems have been corrected.

8.1.2 Hooks.

Check for wear or damage, increased throat width, bent shank or twisting of the hook. Replace hooks which exceed the allowable wear limits or exceed a 10 degrees twist. If the hook latch snaps past the tip of the hook, the hook is damaged and must be replaced. Check hook support swivels for excessive clearance or damage. Ensure they swivel easily and smoothly.

With reference to Figure 6, the allowable wear limits are:

- No more than 10% increase of size ***a***, compared to original measurement;
- No more than 5% decrease in size ***h***, compared to original measurement;

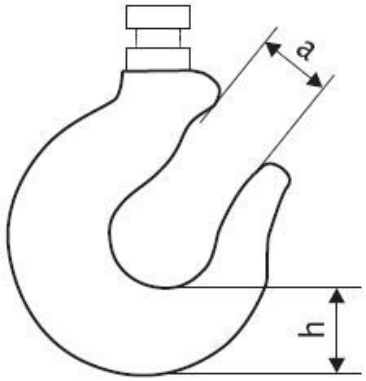


Figure 6: Hook wear sizes

Hook size [ton]	Stock Number*	Hook opening dimension [mm]+		Height dimension [mm]	
		Nom.	Max.	Nom.	Min.
0,5 - 2	JS01365	27,0	29,7	27,0	25,7
3	HS04442-1	33,0	36,3	37,9	36,0
5-6	HS04440	41,5	45,7	47,0	44,7
10	HS04443	58,0	63,8	60,0	57,0
16	HS04444	66,0	72,6	67,0	63,7
20	JS61101	87,0	95,7	80,0	76,0
25	JS61001	71,0	78,1	85,0	80,8
50/60	HS50302	112,0	123,2	132,0	125,4
*If the stock number of your hook deviates from the stock number in this table, contact ELEPHANT LIFTING for the appropriate sizes.					
+If safety catch fitted, subtract the thickness of the safety catch from the maximum hook opening dimension "a"					

Table 1: Hook Dimensions and Wear Limits

The sizes in Table 1 on page 25 are based on nominal dimensions. Due to manufacturing tolerances it is possible for the hook dimensions to vary by up to ± 6%. The allowable wear limits must therefore be based on the original measured size of the specific hook when new.

8.1.3 Hook Safety Latch.

Make sure the hook safety latch is present and operating properly. Replace if necessary.

WARNING

Do not use hoist if hook safety latch is missing or damaged.

8.1.4 Load Chain.

Examine each of the links for bending, cracks in weld areas or shoulders, traverse nicks and gouges, corrosion pits, and chain wear, including bearing surfaces between chain links (see Figure 7). Replace a chain that fails any of the inspections. Check chain lubrication and lubricate if necessary. Refer to “Load Chain” in “Lubrication” Section 9.3.

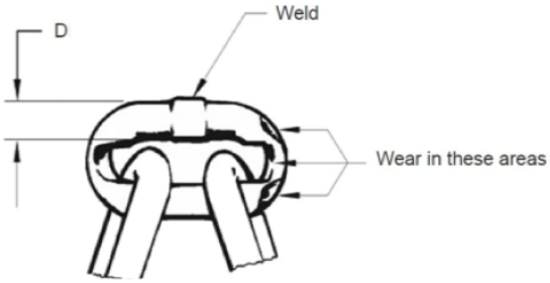


Figure 7: Chain Link

WARNING

The full extent of load chain wear cannot be determined by visual inspection. At any indication of load chain wear inspect chain and chain wheel in accordance with instructions in “Periodic Inspection” Section 8.2.12.

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). There is a danger of fracture. Particular care must be taken to properly inspect rusted chain for cracking if it has not yet been replaced. ELEPHANT LIFTING

recommends that all rusted chain is replaced immediately.

8.1.5 Testing the Brake (Hoist and Trolley motor)

Test the brake function daily
When the pushbuttons of the controls are released, the motor must not keep running for an unusually long time.

DANGER

If the load is lowered and the trolley/hoist keeps running for an unusually long time after braking, the brake must be repaired.

8.1.6 Load Chain Reeving.

Ensure welds on upright links face away from the center of the driven load sheave. Reinstall chain if necessary. Make sure chain is not twisted or kinked. Adjust as required.

8.1.7 Chain Bag / Container.

Check for damage or excessive wear and that the chain container is securely attached to the hoist. Secure or replace if necessary. Ensure correct positioning of the chain bag.

DANGER

Although the use of a chain bag gives a large increase to operational safety in most applications, it still represents a notable safety risk (even under no load) which must not be overlooked. Particular attention must be given to ensuring the chain feeds into the chain bag properly and that "piling" is not occurring. Running the chain without lubrication, or with rust on the chains, increases the chances of "piling" inside the chain bag. Which can lead to failure of the bag and dropping of the load chain. This must therefore be avoided.

8.1.8 Chain Travel Buffers.

On ELEPHANT LIFTING pneumatic and hydraulic hoists, the travel buffers are securely attached to the load chain. When functioning as hook travel limits, they operate in conjunction with the load limiter which stops the motor if pulled against the hoist. If the buffers are pulled against the hoist and the hoist stops, release the controls.

DANGER

The chain travel buffers, and load limiter, must not be used to stop the hoist from lifting/lowering under normal function. If the hoist is run against the buffers it will load the hoist to the full capacity allowed by the load limiter (generally 125% WLL). The travel buffers are safety devices for emergency use only.

8.1.9 Air System

On Air hoists, Visually inspect all connections, fittings, hoses and components for indication of air leaks. Repair any leaks found.

8.1.10 Hydraulic System

On Hydraulic hoists Visually inspect all connections, fittings, hoses and components for indication of leaks. Repair any leaks found. Inspect condition of oil and filters as outlined in section 3.10.

8.1.11 Controls

During operation of the hoist, check that the response of the hoist to the pendent is smooth and not sticky. Ensure that the control lever/button switches to its maximum position. The control lever/button must return to neutral when released. If hoist responds slowly or movement is unsatisfactory, do not operate hoist until all deficiencies have been corrected. If fitted with an E-Stop button, ensure that when activated the hoist does not operate.

8.1.12 Daily Inspection for Machines Operated in Corrosive Environments

If the operating environment is at all corrosive, a more in-depth daily inspection should be undertaken; All exposed bearings should be checked to see if they rotate freely. Unshielded bearings and exposed, untreated steel should be well greased. If the machine has a roller chain for 2-wheel drive, this should be kept well lubricated.

8.1.13 Trolley Wheel flanges

Over time the flanges on the trolley wheels of ELEPHANT LIFTING hoists will wear down. Visually inspect that that the trolley wheels are not excessively worn (indicated by a larger than normal gap between the trolley wheel flange and beam). Do not operate a h

DANGER

Maintenance work on ELEPHANT LIFTING Hoists/Trolleys must only be performed by trained and qualified personnel. In the case of maintenance work exceeding normal service and maintenance, please contact ELEPHANT LIFTING for specific instructions.

8.2 Periodic Inspection

The frequency of periodic inspection depends on the severity of usage:

USEAGE	NORMAL	HEAVY	SEVERE
INSPECTION FREQUENCY	YEARLY	BIANNUALLY	QUARTERLY

NOTICE

Please note the requirements of the Occupational Health and Safety Act of South Africa (Act 85 of 1993), Driven Machinery (Regulation 18) Lifting Machines and Lifting Tackle regarding the examination and testing of lifting machines and lifting tackle.

Disassembly may be required for HEAVY or SEVERE usage. Keep accumulative written records of periodic inspections to provide a basis for continuing evaluation. Inspect all the items in "Frequent Inspection", and also inspect the following:

8.2.1 Fasteners

Check cap screws and nuts. Replace if missing or tighten if loose – in accordance with Section 11.

8.2.2 All Components

Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates the need, disassemble. Check gears, shafts, bearings, load sheaves, chain guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.

8.2.3 Hooks

Inspect hooks carefully for cracks using magnetic particle or other suitable non-destructive testing methods. Inspect hook swivels for smooth function. Tighten swivel bolts if necessary.

8.2.4 Load Sheaves

Check for damage or excessive wear. Replace if necessary. Observe the action of the load chain feeding through the hoist. Do not operate a hoist unless the load chain feeds through the hoist and undercarriage smoothly and without audible clicking or other evidence of jamming, wedging or malfunctioning.

8.2.5 Air Motor

If performance is poor, disassemble the motor and check for wear or damage to bearings, vanes, cylinder end plates and other parts. The parts should be cleaned, lubricated and reassembled. Replace worn or damaged parts.

8.2.6 Brake

Raise a load equal to the rated capacity of the hoist about 200mm off the floor. Verify hoist holds the load without slipping. If slipping occurs, disassemble the brake to remove brake disc/s. Check and clean the brake parts each time the hoist is dismantled. Replace the brake discs if overall wear of the brake disc stack exceeds 0,5mm.

8.2.7 Supporting Structure

Check for distortion, wear and continued ability to support the load.

8.2.8 Trolley (If equipped)

Check that the trolley wheels run properly on the beam and that the distance between wheel flanges exceeds the beam flange size by 2 to 3 mm. Check that wheels and rail are not excessively worn and inspect the side plates for opening up due to bending. Do not operate the hoist until any problems have been identified and corrected.

8.2.9 Nameplate/Warning Stickers/Max Load Markings

Check for presence and legibility. Replace if necessary.

8.2.10 Trolley Wheel Flanges

Trolley wheel flanges must be inspected for excessive wear. The minimum allowable thickness of the wheel flange is shown in the table below as a function of wheel size. It may be necessary to reduce the width of the trolley side plates to account for wear before the wheel reaches the minimum allowable size.

Wheel Diameter [mm]	Limit size of flange thickness [mm]
65	2,7
90	5
110	5,5
145	6
200	10

8.2.11 Track Clamp Brake Pads (if fitted)

Measure the thickness of the friction material on the track clamp brake pads, in the region of contact with the beam. The brake shoe assembly, TSP00210CP, should be replaced when the thickness of the available friction material reaches 1,1mm, and shall be replaced if the thickness is less than 0,9mm or there is evidence of wear on the rivets.

8.2.12 Load Chain and Anchors.

Ensure both ends of the load chain are securely attached to the hook swivel or dead end pin. Secure if loose, repair if damaged, replace if missing. Always use the load chain recommended by ELEPHANT LIFTING for the desired application.

Measure the load chain for wear and stretching as shown in Figure 9 and compare to the allowable limits in Table 2, both on page 29.

Take care to take the measurements on that part of the chain which comes into contact with the load sheave most often. If the measurements deviate from values shown in Table 2, replace the chain.

The chain must be checked for a reduction of the average wire diameter(d_m) *at any point* on the chain link of more than 10% of the nominal diameter. The average wire diameter $d_m = \frac{d_1+d_2}{2}$. Where d_1 and d_2 are two individual measurements (d_1 *and* d_2) made at an angle of 90° to each other as shown in Figure 8.

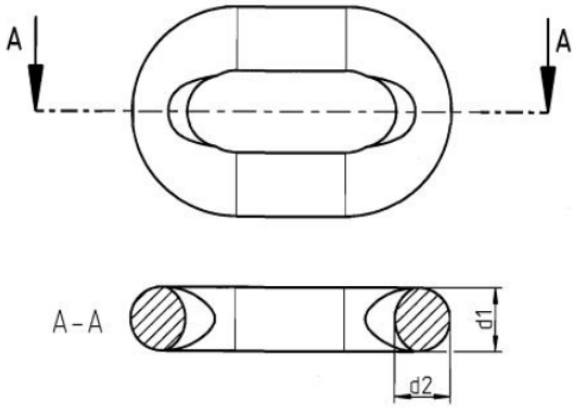


Figure 8 : Average wire diameter inspection points

Load Chain and anchors continued

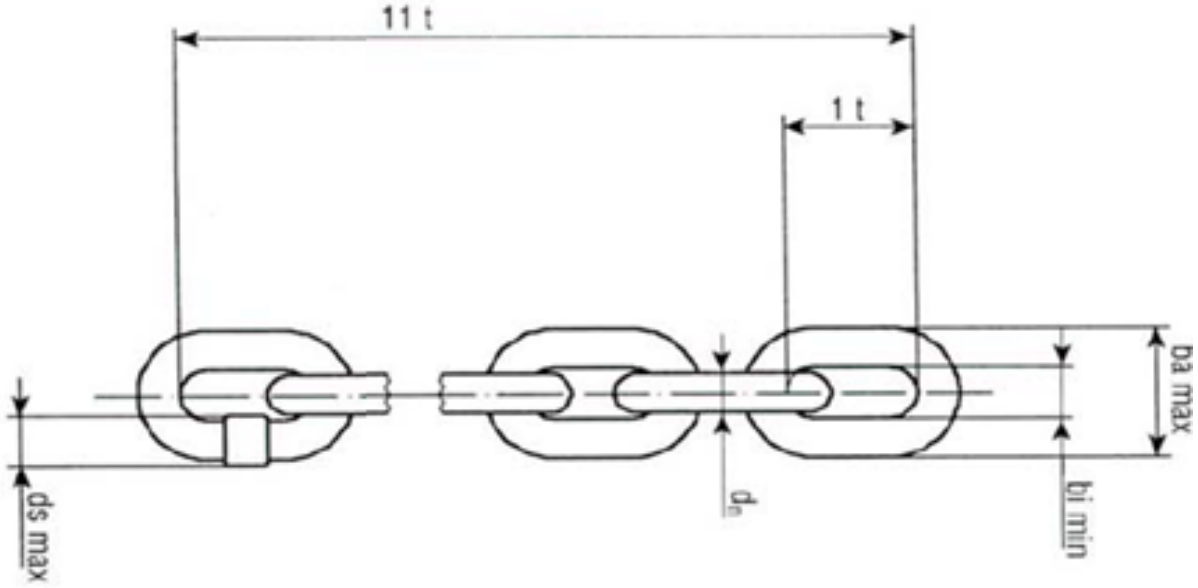


Figure 9: Chain inspection points

Chain d x t	7x21 [mm]	9x27 [mm]	11.2x34 [mm]	13x36 [mm]	16x45 [mm]	23.5x66 [mm]
dn	≤7.1	≤9.1	≤10.8	≤13.1	≤16.1	≤23.8
1t	21	27	34	36	45	66
1t max	≤ 22,05	≤ 28,35	≤ 35,7	≤ 37,8	≤ 47,25	≤ 69,3
11t	231	297	374	396	495	726,5
11t D	≤ 237,93	≤ 305,91	≤ 385,22	≤ 407,88	≤ 509,85	≤ 748,295
11t M	≤ 235,62	≤ 302,94	≤ 381,48	≤ 403,92	≤ 504,9	≤ 741,03
bi min	8.4	10.8	14.0	14.9	18.2	27.0
ba max	23.6	30.4	38.0	42.9	52.8	76.6
ds max	7.5	9.6	12.0	13.9	17.2	24.6
d_m	≥ 6,3	≥ 8,1	≥ 10,08	≥ 11,7	≥ 14,4	≥ 21,15

Table 2: Allowable Chain Wear Sizes

8.3 Hoists Not in Regular Use

1. A hoist which has been idle for period of one month or more, but less than one year, should be given an inspection conforming with the requirements for "Frequent Inspection" prior to being placed into service.

2. A hoist which has been idle for a period of more than one year should be given an inspection conforming with the requirements of "Periodic Inspection" prior to being placed into service.

3. Standby hoists should be inspected at least biannually in accordance with the requirement of "Frequent Inspection". In abnormal operating conditions hoists should be inspected at shorter intervals.

8.4 Cleaning and Care

If your ELEPHANT LIFTING hoist/trolley must work in dirty surroundings, remove coarse dirt from the hoist/trolley.

8.5 Spare Parts

If, during repair work, the replacement of components is necessary, only original ELEPHANT LIFTING spare parts may be installed. If other components are used danger may occur. Such action can only be allowed after having received ELEPHANT LIFTING agreement.

8.6 Records and Reports

An inspection record shall be maintained for each hoist, listing all points requiring periodic inspection. A written report should be made monthly on the condition of the critical parts of each hoist. These reports should be dated, signed by each person who performed the inspection, and kept on file where they are readily available to authorized personnel.

9 LUBRICATION

To ensure continued satisfactory operation of the hoist, all points requiring lubrication must be serviced with the correct lubricant at the proper time interval. Correct lubrication is one of the most important factors in maintaining efficient operation.

The lubrication intervals recommended in this manual are based on intermittent operation of the hoist eight hours each day, five days per week. If the hoist is operated almost continuously or more than the eight hours each day, more frequent lubrication will be required. Also, the lubricant types and change intervals are based on operation in an environment relatively free of dust, moisture, and corrosive fumes. Use only those lubricants recommended. Failure to observe this precaution may result in damage to the hoist and/or its

CAUTION

associated components.

If grease becomes contaminated with dirt or other abrasive material, clean off old grease and apply new grease.

9.1 Air Motor

Coat all motor parts with a light film of SAE 10W or 27 – 32 centistoke or good quality hydraulic oil before assembling. Use an airline lubricator whenever possible, using a lubricator will prolong the life of the motor, protect against corrosion, and improve performance. See Section 17 for further information.

WARNING

Do not use automotive type detergent oil. Detergents will de-laminate the motor vanes and cause motor failure.

9.2 Gearing

Apply a coating of grease to all gearing before assembly. Neglect of proper lubrication will lead to failure. The recommended greases are as follows: DIMOL GR-2-EP, CASTROL SHEEROL EP2 and SHELL ALVANIA EP2. If these specific greases are not available use equivalent grease.

Lubricate exposed trolley drive pinion and wheel teeth with grease as often as necessary to keep the teeth liberally covered.

DANGER

When greasing pinion and geared wheels make sure excess grease is removed from the Trolley wheels, and riding surface of the beam. Failure to keep beam track and wheel contact surface clean affects the safe operation of the Trolley/Hoist.

9.3 Load Chain

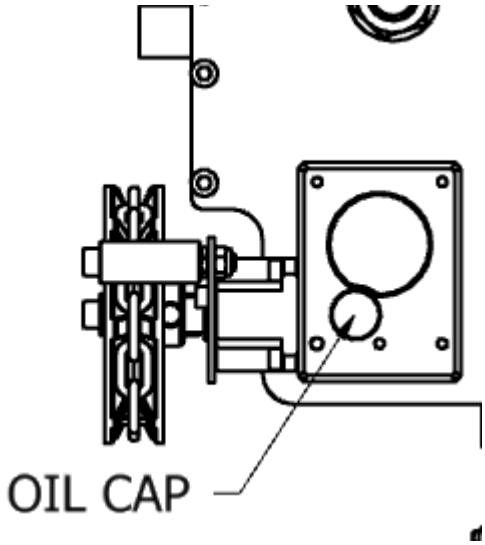
The load chain of ELEPHANT LIFTING hoists must be lubricated in the unloaded condition. Start by cleaning heavily contaminated chains, then coat the chain in lubricant.

Under normal operation the chain should be coated liberally with a 40W or 150 centistoke good quality oil. If

the hoist is being used in extreme environments, such as offshore, OPTIMOL VISCOGEN KL300 should be used - it is available as an aerosol, and in a drum. It is water resistant and will give maximum chain life.
Lubrication should only be omitted if there are abrasive substances in the working environment which could be deposited in the lubricant and so create an abrasive effect which would increase chain wear. A dry lubricant must be used in this instance.

9.4 Worm drive gearbox (if fitted)

The worm drive gearbox must be filled with 10ml of Mobile Delvac Synthetic Gear Oil 75W-90.. Oil will begin to spill out of the port when the gearbox is completely filled.



To achieve this, remove the oil cap and use a tube and syringe (supplied with the hoist) to fill the port. Oil should be replaced on an annual basis. Used oil can be drained through the fill port using the supplied tube and syringe.

10 OVERLOAD PROTECTION

ELEPHANT LIFTING air hoists have overload protection fitted as a standard feature. Overload protection automatically disables the “UP” lifting operation if the load reaches or is greater than a maximum set load. The maximum load setting is between 110% and 125% of the hoists rated load

DANGER

capacity.
Tampering with the load limiter in order to lift loads above the rated load of the hoist is a violation of the intended use as specified in Section 3.5. And could lead to overload condition and dropped load.
ELEPHANT LIFTING hoists have the load limiter set, and validated with a load test, during factory acceptance testing. If the load limiter is adjusted after this factory testing a load test and overload test must be conducted and recorded, to verify correct functioning of the load limiter. Failure to do so could lead to an overload condition and dropped load.

10.1 Delta P Load Limiter (HS50400CP)

Some ATS Pneumatic hoists are fitted with Delta P load limiters which function by disrupting the air supply to the motor.

The overload protection can also respond to a load that is less than the max shutoff setting if, for example, a load is abruptly lifted by a slack chain. It is therefore always recommended to take up any slack in the lifting chain prior to attempting to lift the load, and to lift the load slowly and progressively – avoiding “shock” loadings.

Delta P Load Limiter - Overload Testing
If it is necessary to overload test the hoist, the Overload Protection can be bypassed by removing the blanking plug.

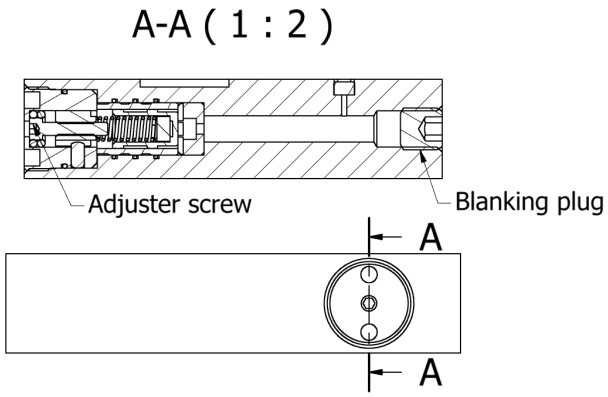


Figure 10: Diagram of load limiter

DANGER

Once the overload test is complete the blanking plug must be re-inserted and properly sealed with a thread sealing agent. The overload protection will not function consistently if air is able to leak past the locking cap screw.

Delta P Load Limiter - Adjusting the Overload Protection

DANGER

If the overload protection is incorrectly adjusted the hoist may be overloaded – leading to failure of the chain, or other components of the hoist, which may result in dropping of the load.

To adjust the overload setting, turn the adjuster screw to adjust the overload protection setting. Turn the screw clockwise to increase the shutoff setting (lift less load) or counter- clockwise to decrease the shutoff setting (lift more load).

10.2 Mechanical Load limiter

Most ELEPHANT LIFTING hoists are fitted with mechanical load limiters on the first stage of the gearbox. This load limiter requires special tooling to reset. It is set at 125% WLL at the factory and should not require adjustment throughout the hoist's life. If the load limiter is activating it is likely the hoist is in an overload condition.

If you feel the load limiter requires adjustment for any reason, contact ELEPHANT LIFTING for specific instructions and to attain tooling.

11 BOLT TORQUE REQUIREMENTS

Torque requirements for cap screws and bolts on ELEPHANT LIFTING hoists are outlined below.

DANGER

The below values DO NOT apply to crosshead or axle nuts – nor to stainless steel fasteners. Only to the relevant 8.8/9.8 and 10.9/12.9 bolts specified. Overtightening bolts, or nuts could lead to failure.

Metric Coarse Thread Torque [Nm]				
Size	Class 8.8/9.8		Class 10.9/12.9	
	Dry	Lubricated	Dry	Lubricated
M6x1	12 - 14	8 - 9	15 - 16	11 - 12
M8x1,25	28 - 31	22 - 24	35 - 41	27 - 30
M10x1,5	56 - 64	42 - 47	72 - 81	53 - 61
M12x1,75	96 - 110	73 - 83	123 - 140	92 - 104
M14x2	156 - 176	117 - 133	199 - 225	149 - 169
M16x2	224 - 254	168 - 190	308 - 348	230 - 262
M18x2,5	309 - 350	232 - 262	426 - 483	319 - 362
M20x2,5	435 - 494	327 - 370	601 - 681	450 - 510
M22x2,5	595 - 674	446 - 506	820 - 930	616 - 697
M24x3	754 - 854	565 - 641	1040 - 1178	780 - 884
M30x3,5	1495 - 1695	1121 - 1272	2062 - 2337	1547 - 1753
M42x4,5	1850 - 2000	1350 - 1400	-	-
M64x4	4750 - 4950	3390 - 3600	-	-
M72x4	5000 - 5250	3800 - 4050		

Metric Coarse Thread Torque [Foot-pounds]				
Size	Class 8.8/9.8		Class 10.9/12.9	
	Dry	Lubricated	Dry	Lubricated
M6x1	9 - 10	6 - 7	11 - 12	8 - 9
M8x1,25	21 - 23	16 - 18	26 - 30	20 - 22
M10x1,5	41 - 47	31 - 35	53 - 60	39 - 45
M12x1,75	71 - 81	54 - 61	91 - 103	68 - 77
M14x2	115 - 130	86 - 98	147 - 166	110 - 125
M16x2	165 - 187	124 - 140	227 - 257	170 - 193
M18x2,5	228 - 258	171 - 193	314 - 356	235 - 267
M20x2,5	321 - 364	241 - 273	443 - 502	332 - 376
M22x2,5	439 - 497	329 - 373	605 - 686	454 - 514
M24x3	556 - 630	417 - 473	767 - 869	575 - 652
M30x3,5	1103 - 1250	827 - 938	1521 - 1724	1141 - 1293
M42x4,5	1365 - 1475	995 - 1030		
M64x4	3500 - 3650	2500 - 2650	-	-
M72x4	3690 - 3870	2800 - 2990		

1. Definitions
   Dry = Cadmium Plate, zinc plate, and oiled fasteners.
   Lubricated = Molysulfide paste, carnaba wax, molysulfide grease, and copper-based anti-seize coated fasteners.
2. If mixing fasteners use lowest torque value.
3. Torque values 75 to 85% of fastener proof load (for 8.8 and 10.9 fasteners) – **not applicable to stainless steel fasteners.**

12 TROUBLESHOOTING TABLE

DANGER

The below is a brief list of trouble shooting points. It is not exhaustive, nor does it intend to replace the judgment of competent and experienced personnel. Please contact ELEPHANT LIFTING PRODUCTS, LLC for specific instructions should you experience a problem outside the scope of the below table.

SYMPTOM	CAUSE	REMEDY
Lifting not possible	Supply pressure too low	Increase supply pressure to the relevant value, as per name plate.
	EMERGENCY STOP button pressed	If there is no danger, release the EMERGENCY STOP button
	Control is faulty	Have control repaired
	Load limiter triggered (overload condition)	Reduce load.
	Load limiter triggered (no overload condition)	Engage down function, and then attempt lift again.
	Shuttle within the valve may not be positioning correctly	See bottom of page 36.
Lowering not possible	Shuttle within the valve may not be positioning correctly	See bottom of page 36.
Lifting slowly (powered hoist)	Supply pressure too low.	Increase supply pressure to the relevant value, as per name plate.
	Supply flow rate too low.	Increase supply pressure to the relevant value, as per name plate.
	Blocked supply line filter.	Replace filter.
Load drifts down	Faulty brake	Remove hoist from service and rectify brake problem.
E-stop button doesn't stay in	Dirty vent filter	Clean/replace vent filter at the back of the hand control
Noise from load chain	Chain entering hoist skew	Ensure chain enters hoist straight (with no twists), and that hoist is properly level. Ensure chain is in good condition still.
	Incorrect chain	Ensure correct load chain is used.
	Chain not lubricated	Lubricate chain appropriately.
	Chain worn or damaged	Replace chain.
Trolley cannot be moved	EMERGENCY STOP button pressed	If there is no danger, release the 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

13 TECHNICAL SPECIFICATIONS AND MACHINE DIMENSIONS

A technical drawing of your specific hoist containing machine dimensions and performance specifications should be attached as an appendix to this manual. If this drawing has not been attached contact ELEPHANT LIFTING quoting your hoists model and serial number to attain it.

14 EXPLODED VIEWS AND SPARE PARTS

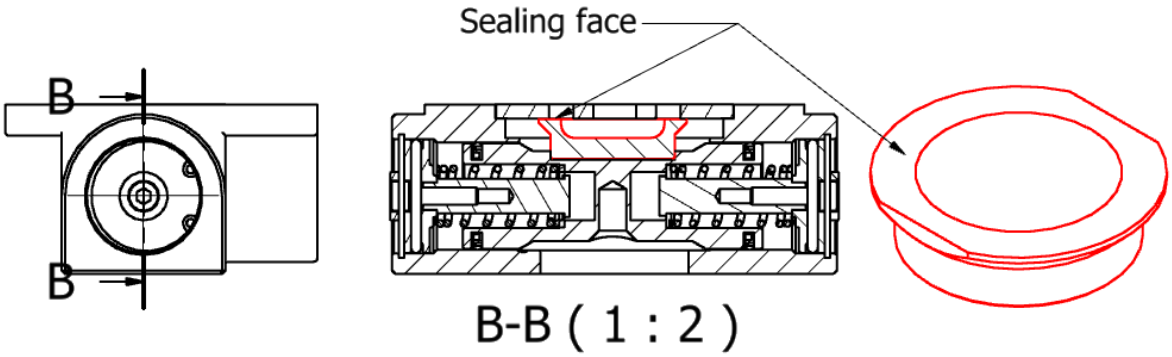
A set of exploded views for your specific hoist should be attached as an appendix to this manual. Certain spare parts can be ordered from ELEPHANT LIFTING PRODUCTS, LLC by quoting the relevant stock number. If the exploded view pack has not been attached contact ELEPHANT LIFTING quoting your hoists model and serial number to attain it.

15 FURTHER MAINTENANCE AND REPAIR INSTRUCTIONS

Further maintenance and repair instructions, outside of the scope of this manual, may be available from ELEPHANT LIFTING PRODUCTS, LLC. Contact ELEPHANT LIFTING PRODUCTS, LLC quoting your hoists model and serial number to attain them. ELEPHANT LIFTING PRODUCTS, LLC will assess such requests on a case by case basis.

15.1 HOISTS WITH SHUTTLE VALVE DESIGN

SYMPTOM	CAUSE	REMEDY
Lifting and/or lowering not possible (Pneumatic hoists with shuttle valve)	Hoist control valve shuttle seized.	Strip hoist control valve. Check sealing face of plastic shuttle for possible signs of damage (e.g. grooves/notches). Smooth the sealing face with emery paper and lubricate with light weight non-detergent oil. Then re-assemble.
Trolley cannot be moved in one or both directions (pneumatic hoists with shuttle valve)	Trolley control valve shuttle seized.	Strip trolley control valve. Check sealing face of plastic shuttle for possible signs of damage (e.g. grooves/notches). Smooth the sealing face with emery paper and lubricate with light weight non-detergent oil. Then re-assemble.



16 PNEUMATIC & HYDRAULIC HOISTS AND TROLLEYS INTENDED FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES

CE

Form ATS-ATEX1
Edition 5
August 2019

The EC Declaration of Conformity in this manual states that these Pneumatic Hoist and Trolley models are in compliance with European Community Directive 94/9/EC for equipment intended for use in potentially explosive atmospheres, commonly referred to as the ATEX Directive. Standard Pneumatic Hoist and Trolley models conform to and are marked for use as defined by ATEX designation:

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

Standard version ELEPHANT LIFTING hoists (as fitted standard with Galvanised chain) are category 2 devices Guideline 94/9/EC, for use in zone 1 and 2 for gases of explosion group IIA. 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.

Hoist and Trolley models with the additional “special spark proof design” package of spark protection conform to and are marked for use as defined by ATEX designation:

 II 2 GD IIC T4 (X) /  II 2 GD IIB T4 (X)

ELEPHANT LIFTING hoists of the version “**with special spark proof design protection**” (SP) satisfy additional explosion protection requirements. With the exception of carbon disulphide (temperature class T6), they can be used in presence of all gases in zones 1 and 2 and dusts with glow temperatures above 210° or ignition temperatures above 202° in zones 21 and 22, and can be marked. For further operating conditions, see instructions for safe operation.

ELEPHANT LIFTING trolley running gear “with Special spark proof design protection”
For use in zone 1 in the presence of gases in explosion group IIC, bronzed / Nickeled running wheels or running wheels made of bronze or Stainless steel are also used. The highest possible designation for this version (SPR) is
EX II2 GD IIC T4 (X) (the same as for ELEPHANT LIFTING hoists “with Special spark proof design protection”).

These ATEX designations define the applications, the type and duration of the potentially explosive atmospheres, the type of protection, and the maximum surface temperature.

Hoists intended to be used in underground parts of mines as well as those parts of surface installations of such mines endangered by firedamp and/or combustible dust are marked for use as defined by ATEX designation:


I M2 IIB T4 (X)

The **X** indicates that additional special conditions are required for safe application, operation and/or maintenance of these tools when used in potentially explosive atmospheres.

These ATEX designations define the applications, type and duration of the potentially explosive atmospheres, type of protection, and the maximum surface temperature.


This symbol indicates certification for use in an explosive atmosphere and is followed by other symbols indicating the details of that certified use.

I- Indicates Equipment Group I - Mine use.

II- Indicates Equipment Group II - Non-Mine Use.

2- Indicates Equipment Category 2 - Equipment Category 2 is intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are only occasionally likely to occur. Protection level is very high during normal use and in the event of frequently occurring disturbances or equipment faults.

3- Indicates Equipment Category 3 - Equipment Category 3 is intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are unlikely to occur. Protection level is normal during intended use and in the event of infrequently occurring disturbances or equipment faults.

M2- These products are intended to be de-energized in the event of an explosive atmosphere. Protection methods must be incorporated to provide a high level of safety.

G - Indicates evaluation for explosive atmospheres caused by gases, vapours or mists.

D - Indicates evaluation for explosive atmospheres caused by dust.

T - Indicates the maximum surface temperature Class.

X - Indicates that there are special conditions for safe application, installation, operation and maintenance which must be followed for the certification to apply.

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

EX II 2 GD IIA T4 (X) /II 3 GD IIB T4 (X) or **EX II 3 GD IIA T4 (X):**

This designation does not permit use in the presence of the extremely flammable substance 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 20 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.

EX II 2 IIC T4 (X) or **EX II 2 GB IIB T4 (X):**

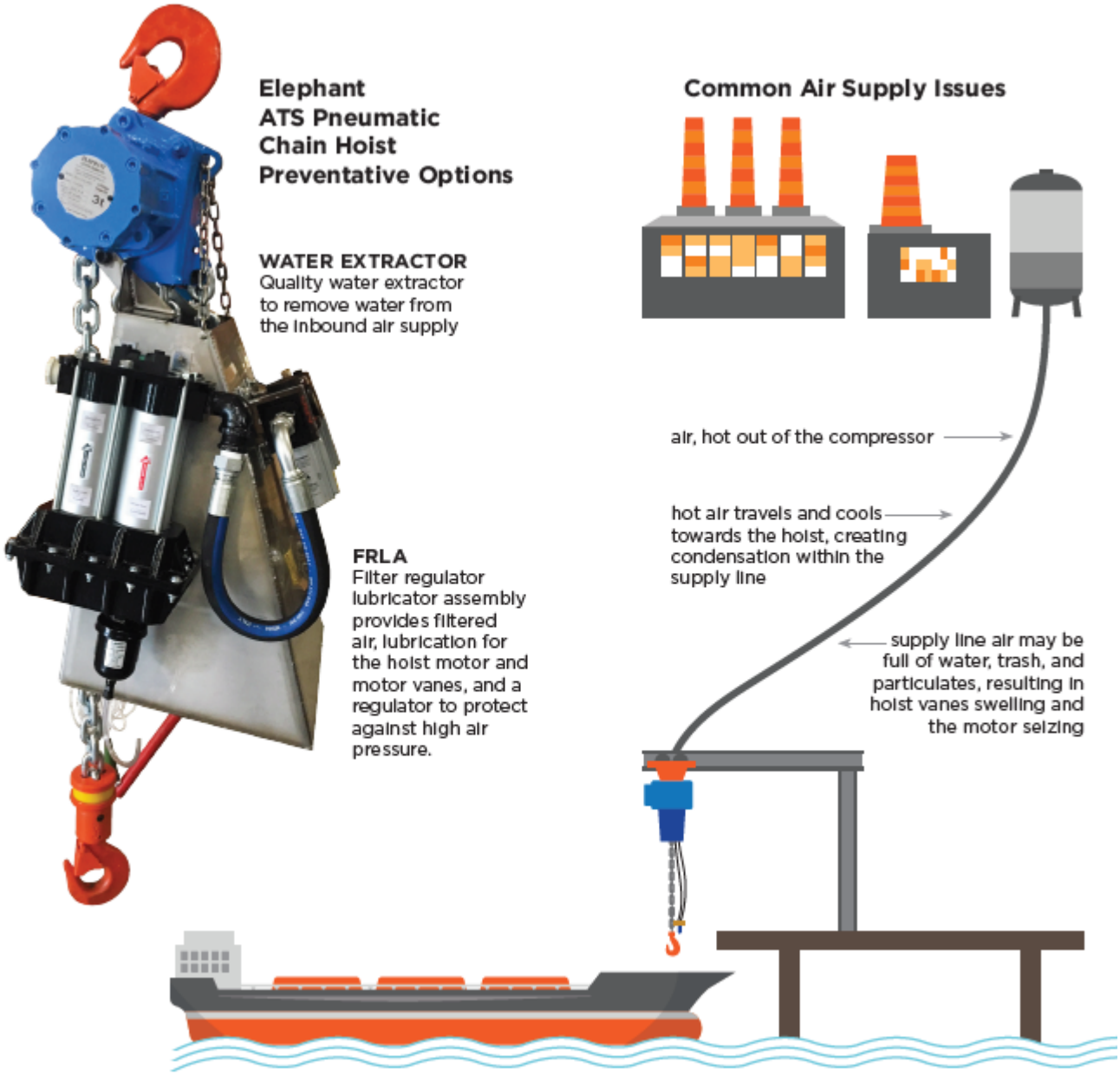
The permissible ambient temperature range (Ta) extends form – 20° C to + 70° c. At carrying capacities above 20 tons, continuous operation of the hoists is not permitted if the ambient temperature exceeds 50° C. In these cases, cooling times must be observed in order not to exceed the permissible surface temperatures.

DECLARATION OF CONFORMITY

Supplier's Name: **ELEPHANT LIFTING PRODUCTS, LLC**	*Address:* **38381 N ROBERT WILSON RD, GONZALES, LA**
Declare under our sole responsibility that the product: **ELEPHANT LIFTING Series Air and Hydraulic Chain Hoists / Trolleys**	
Model: **ATSi, Rigga**	
To which this declaration relates, is in compliance with provisions of Directives: **2006/42/EC (Machinery), 94/9/EC (ATEX), as well as SANS 1638, ASME B30.16**	
By using the following Principle Standards: **EN 292-1; EN 292-2; EN 418;EN 983; F.E.M. 1.001; F.E.M. 9.511; EN 13463-1; pr EN 13463-5; EN 1127-1**	
Serial Number Range: **9012 and up**	Date: **August 2014**
Approved By:	
_____ Bryan Davis – ELEPHANT LIFTING PRODUCTS, LLC. (USA) **Managing Director**	

17 A NOTE ON THE AIR SERVICE UNIT

Experience has shown that using an appropriate air service unit drastically decreases the incidence of hoist problems in the field. An investment in a proper air service unit at the start of the hoists service life is heavily recommended to improve the longevity of the product and reduce the chance of breakdowns.



OPTIONAL : Extractor / Dryer

compressed air filter is HIGHLY recommended to help reduce moisture from your inbound air supply, to the hoist motor. This should be installed as near to the hoist motor as possible.

•150 SCFM, 2 Stage Filter - 1" NPT
• Float Drain

•Extractor/Dryer compressed air filter removes harmful moisture and contaminants from compressed air lines simply and economically.

•This two-stage mechanical filter works best when placed at the point of use. This allows the hot compressor air time to cool and condense, thus enabling the extractor/dryer to do its job. In the first stage, a coalescing effect separates particles and water droplets from the airflow. The moisture and any particulates are then extracted in the base chamber and out through the weep or float drain. In the second stage, air passes through a wire supported fiber filter cartridge where any remaining moisture or contaminates are filtered down to 5 micron. The result is clean, dry air.

Features
•Differential pressure gauge is standard on all units from 50 to 500 scfm
•Weep drain standard
•Energy Reduction: Uses less energy than competing products with same function and purpose

Specs
Port size : 1.00", port location : side, drain type : float drain, flow : 150 SCM, port type : NPT, pressure (max) : 250 PSI, weight : 18.0 lbs

18 SERVICE NOTES

SERVICE NOTES

ELEPHANT
LIFTING PRODUCTS™

ATS
PNEUMATIC

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