
ProWINCH[®]

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User Manual
and safety warnings

PWRN - High Capacity



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PROWINCH LLC COMPANY WITH QUALITY MANAGEMENT SYSTEM



DISCLAIMERS

PROWINCH® HOIST

Prowinch LLC. states that has given the customer all the safety warnings related to this equipment in his knowledge, and that in no case hazards are limited to the given information.

So, in behalf of that, PROWINCH LLC does not assume any responsibility for any problems or injuries that the customer or third parties may suffer if caused by careless use or not complying direct or indirectly the operation and safety instructions indicated in this User's Manual with the warnings associated with the acquired unit. Prowinch LLC will not respond for any accidents or harm done to persons or the property that may result as a consequence of the wrong use of this equipment. Prowinch LLC will not assume any responsibility regarding the use of third party recommendations and does not offer any warranty for them. Any other recommendation does not have any priority over the safety norms in force at customers site. In case of use of the equipment warranty, Prowinch LLC will only execute it and respond if the customer has valid proof of complying with all warnings and safety instructions indicated in this user's manual.

The information contained in this manual may have technical errors over which Prowinch LLC does not assume any responsibility. This user's manual is subject to changes without customers permission or prior advise. Always check www.prowinch.com for the latest information regarding this equipment.

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

This manual is written to be applicable to PROWINCH hoists.

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.

Prowinch 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.

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.

Prowinch 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.

tance.

This operation manual contains important information for the safe, proper and efficient operation of PROWINCH 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 PROWINCH 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 PROWINCH hoist/trolley is being used.

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

1.1 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.

1.1.1 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 PROWINCH 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.

1.2 Organisational 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 PROWINCH 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 the inspection section
- * Implement an inspection log and make regular accurate entries,
- * Regularly check personnel for safety and hazard awareness during work.

1.3 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 sa-

fety, 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.

1.4 Operating Environment

PROWINCH 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 Error! Reference source not found..

1.5 Precaution Signs

Throughout this manual there are steps and procedures which, if not followed, may result in injury, death, and/or destruction property. The following signal words are

DANGER: Used to identify the level of potential hazard.

Danger is used to indicate the presence of hazard which 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: Is used to notify people performing operation, installation, inspection and maintenance information which are important but not hazard-related.

1.6 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).

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 PROWINCH 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.

2.1 Identification

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

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

PROWINCH
Parque Riesco 3407
+56 226218989
info@prowinch.cl

2.2 Main Components

In general, PROWINCH hoists consist of the following components:

1. Motor
2. Gearbox
3. Top Block (with hook/lug/rigid trolley mount)
4. Bottom Block (with hook/lug)
5. Chain
6. Chain container
7. Control Valve (Hydraulic and Pneumatic hoists only)
8. Hand Control (Hydraulic and Pneumatic hoists only)
9. Hand chain (Chain block hoists only)
10. Certain PROWINCH hoists can/must be coupled with trolleys.

In general, PROWINCH Trolleys consist of the following main components:

1. Side plates with axles
2. Rolling wheels
3. Distance spacers
4. Crossheads
5. Motor/Drive for running geared wheels
6. Gearbox
7. Anti-drop plates

2.3 Product Description

PROWINCH 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, PROWINCH hoists can be suspended or built into PROWINCH 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.

PROWINCH trolleys are moved according to their construction:

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

Note: The track width of some PROWINCH 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. PROWINCH trolleys are fitted with anti-lift and anti-drop devices.

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

Special PROWINCH 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 (as described below) in case of especially high requirements for explosion protection
- * Cleaning of the exhaust air by filter silencers
- * Throttle control for reducing the maximum travel speed

2.4 Technical Specifications

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

2.5 Intended Use

PROWINCH Hoists are intended to be used exclusively for lifting and lowering loads within the specified loadcarrying capacities with a vertical load chain.

When coupled with PROWINCH trolleys PROWINCH 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 PROWINCH range of winches and the PROWINCH Rigga range of hoists., PROWINCH 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 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 PROWINCH Hook and Lug mounted Hoists to be used for oblique pulling. Please contact PROWINCH in writing, if oblique pulling is required.

Oblique pulling is not permitted for hoists installed in trolleys or in running gear.

2.6 Operating Conditions

PROWINCH Hoists are extremely robust and require little maintenance. They are suitable for use in explosionhazardous 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 up to approx.

+ 70° C if they are not heated above this level due to external influences. The thermal endurance of chains and hooks is + 150° C.

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

PROWINCH Hoist are not all suited to every operating environment, and some operating environments may require specific versions of PROWINCH 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 PROWINCH 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 PROWINCH 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.

2.7 System Pressures

PROWINCH 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.

2.8 Air Hoist Specific Supply Requirements

PROWINCH 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/m^3 (corresponds to Class 7 in accordance with ISO 8573-1:2001)
- * Pressure dew point at least 10° C below the lowest expected ambient temperature.

A high capacity filter is required with 100 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. Usually an oiler is not required in the service unit.

Also see Lubrication, page 22.

Do not operate PROWINCH Air Hoists with other gases. With moist air and ambient temperatures at or below 0° C, 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 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.

2.9 Hydraulic Hoist Specific Supply Requirements

In order to maintain the maximum efficiency, and proper performance, of PROWINCH 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 and 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 2.7.

The most frequent cause of malfunction or failure of hydraulic equipment is the presence of contaminants in the hydraulic fluid. PROWINCH Hydraulic Hoists require a minimum cleanliness of ISO 8/13.

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.
- * 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-wear "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 dirty. 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 PROWINCH 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 the reservoir. This filter should be rated at Beta 200=6 μm . Filters must include an integral 2,45 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 2.7.

Some Hydraulic Hoists may require a dedicated case drain line, if this is the case pressure on this line must not exceed motor manufacturer requirements. The need for a dedicated case drain line is application specific, but is primarily determined by the back pressure on the return line of the hydraulic powerpack. Contact PROWINCH directly to check if a case drain is necessary based on your system.

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. If the temperature is frequently exceeded component 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.

2.10 Chain block hoist specific requirements

Warning: Chain block hoists are designed to require a pulling load of 25 – 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 Error! Reference source not found., should be sought.

The hand chain of PROWINCH chain block hoists should never be over loaded. 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.

3.1 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 weights 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.

3.1.1 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 7.3.

3.1.2 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.

3.1.3 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 7.3.

The installation of the PROWICH Hoists shall be performed by a qualified person as described in Section **Error! Reference source not found.** 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 PROWINCH hoists must always be lubricated following the instructions outlined in Section 8, failure to do so could result premature wear and failure of the chain.

Danger: Owners and users are advised that regional requirements may apply. It is the duty of the responsible person as described in Section *Error! Reference source not found.* 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 2006/42/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.

4.1 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.

4.1.1 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.

4.1.2 Trolley mounted hoist

Danger: Do not drop lifting equipment; equipment should always be placed properly onto the floor. And should be supported by appropriate means during mounting. PROWINCH trolleys must only be installed by qualified personnel as described in section 1.3. Faulty installation can lead to serious accidents. The trolley girders for PROWINCH trolleys must be able to safely withstand the expected forces.

The rated capacity of the suspended/built-in hoist must not be larger than the rated capacity of the trolley. Dynamic tractive forces have to be considered. PROWINCH 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 4.3.

Suitable end stops must always be installed on the girder beam to prevent the hoist from travelling over the end of the beam.

4.1.3 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 bushes 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 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 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 below), and that any load applied to the trolley falls on this center line.

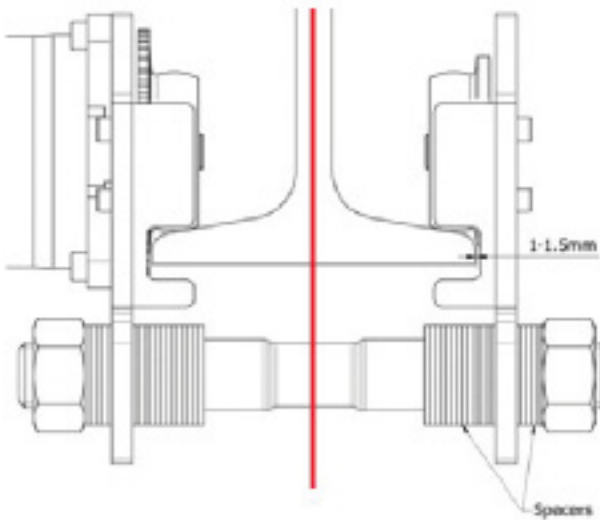


Figure 1: Trolley mounted on girder

4.1.4 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 wider than the bottom girder flange as explained in section 4.1.3.
- * 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 gap on each side between the edge of the bottom girder flange and the wheel flange
- * Engage the drive pinion (if fitted) see section 4.2.

4.1.5 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 wider than the bottom girder flange as explained in section 4.1.3.
- * 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, and ensure that section 5.1.3 is complied with.

- * Engage the drive pinion (if fitted) see section 4.2 4.1.6 Mounting Trolleys with threaded Load Bar into Girders with Open Ends

- * 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 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. 5.1.7 Mounting Trolleys with threaded Load Bar into Girders with Closed Ends

- * 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 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 gap on each side between the edge of the bottom girder flange and the wheel flange.

- * 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 be between 1 and 1,5 mm on either side.

- * The position of the anti-tipping device (If installed). It should have a clearance of approx. 1 mm to the underside of the girder.

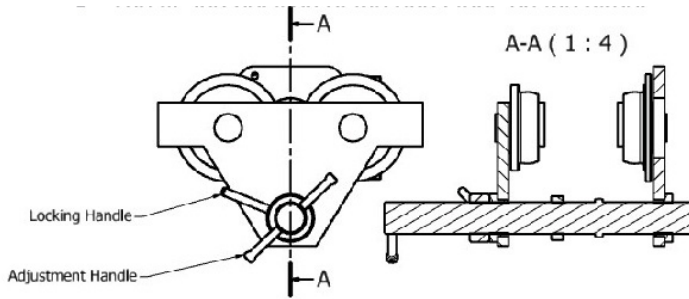
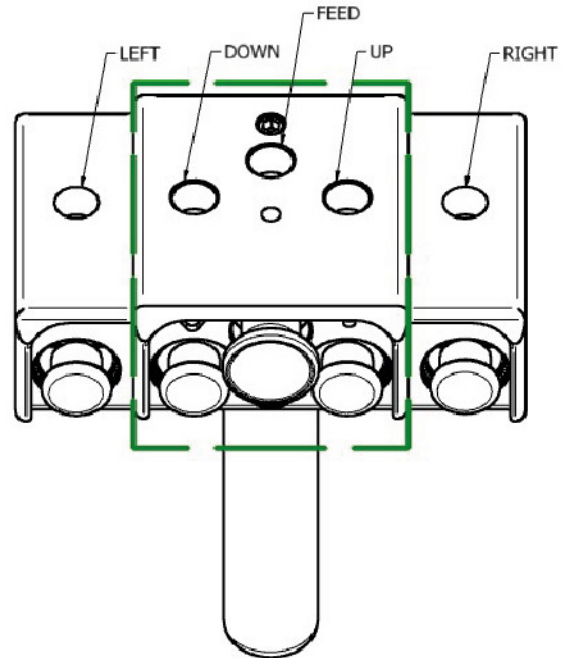
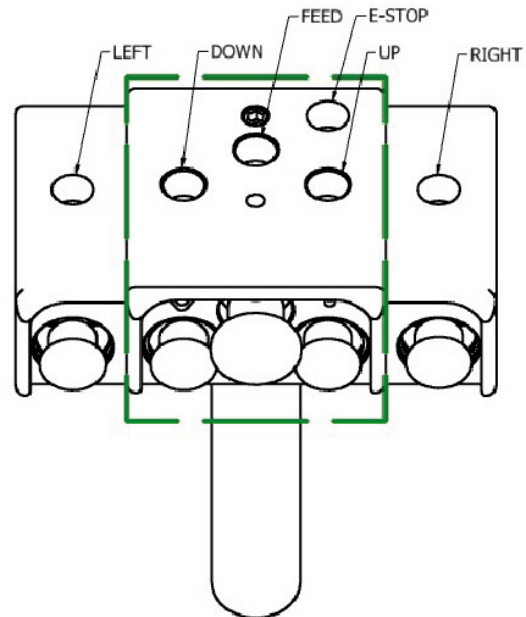


Figure 2: Threaded load bar adjustment handles



- 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 trolley valve (S1/2).
- DOWN:** attach to appropriate port on trolley 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.



The mainline E-stop has an additional part.

4.2 Adjusting the Rack-And-Pinion Drive

The rack-and-pinion drive may be moved vertically if the retaining bolts are loosened. This feature allows for the adjustment of the flank clearance. It also offers the option of releasing the engagement into the rack and pinion.

After mounting the trolley with the rack-and-pinion drive disengaged, the flank clearance must be adjusted.

In case of more than one drive on a running gear, one drive must be engaged first as described. 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.

4.3 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.

4.3.1 Connecting pneumatic control hoses

Pilot line E-stop

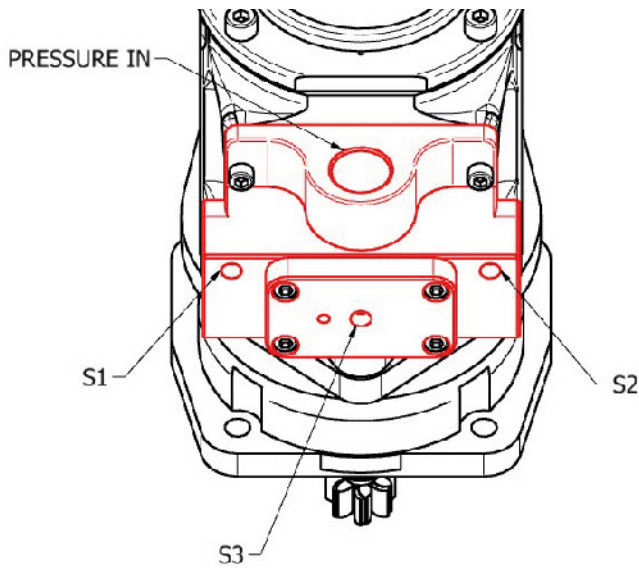
For Hoists fitted with a pilot line E-stop the pilot hoses must be attached to the appropriate control ports as below. PROWINCH hoists are fitted standard with BSP threaded hose fittings. They are attached by tightening the female nut over the male adaptor.

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 5.3.1. If unexpected movement of any type occurs, the pendant control has 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 pressurised or under load. The hoist could exhibit unexpected behavior. Note that the system will remain pressurised even after the main air supply is shut off.

Determining the “Appropriate” valve ports



PROWINCH Pilot valve blocks have three pilot ports.

- 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).

Wireless or other non-standard controls

Contact PROWINCH for specific instructions.

Warning: Only use genuine PROWINCH Pendant controls with PROWINCH hoists/trolleys. 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 PROWINCH valve block with an PROWINCH variable pendant control could lead to unexpected behavior or damage to the hoist. Contact PROWINCH for further information should you require variability on your hoist.

4.3.2 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.

4.3.3 Connecting hydraulic control hoses

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

4.3.4 Connecting the main hydraulic supply

- * Ensure that the points outlined in section 2.9 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.

Danger:

**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

4.4 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 crane for the first time and after any major modification before starting to work with it again, it has to be checked by a qualified person. See also ZH1/27 "Principles for the Testing of Cranes".

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

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

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

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

As according to BGG (ZH1/27), 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 PROWINCH.

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.

4.5 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 1.3 before initial operation and before re-commissio-

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

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.

5.1 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 7.
 - * 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, familiarise 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 accident prevention authorities.
- To ensure the safety of personnel and property when using PROWINCH 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 to + 150° C, permissible ambient temperature: - 20° C to +50° C, permissible heat absorption of the hoist body: max. 90° C.

- * Never allow persons to enter the area below the suspended load.
- * Never attempt to remedy a fault with a load suspended from the hoist.
- * Only use suitable and approved attaching aids; do not jam the hook at the point of attachment.
- * Please ensure that the operator is not put at risk within the operating area by attaching aids or the load. Follow the relevant instructions for attaching loads.
- * Before attaching, accurately position the load vertically below the hoist. The chain must hang vertically before lifting.
- * Ensure that the hook safety catch is closed.
- * Before lifting loads, ensure that the maximum permissible load is not exceeded.
- * Attaching aids must be included in the weight of the load.
- * When taking up and setting down, ensure stable positioning of the load, to prevent accidents due to tilting or falling loads.
- * Never drive against jammed loads.
- * Only use original PROWINCH chain boxes.
- * Ensure that chain enters 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 PROWINCH Hoists with original PROWINCH 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 loosened bolted connections tightened by the Repairs department, in accordance with section 8.7.
- * 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.
- * Do not make modifications to the hoist.

- * Never touch metallic hand controls which are colder than 0° C or hotter than 43° C, without suitable protective gloves.
- * Only use original PROWINCH spare parts. PROWINCH accepts no liability for the use of nonoriginal 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 7.
- * 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.
- * Special safety precautions must be taken when lifting loads into areas which are out of sight.

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

5.2 Company specific Operating instructions

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

5.3 Controls

5.3.1 Pilot Pendant Controls

The hoist is operated via a two button pilot pendant control. The two buttons control the lifting and lowering of the hoist. For hoists mounted on motorized trolleys a four button pilot pendant 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 pendant control allows for precise spotting and variable speed control. The harder the pendant 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. It jumps back into place.

6.1 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).
- * Depressurise the air line.

Make sure to follow the storage and transport instructions specified in Section 3.

6.2 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 Error! Reference source not found. Error! Reference source not found..*

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

PROWINCH Air Hoists must only be dismantled by qualified personnel.

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

1. Check fault list for problem solving.
2. Do not disassemble the hoist any further than necessary to replace or repair damaged parts, unless major service is due.
3. 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.
4. 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.
5. 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.

6.3 Dismantling of the Control Valve (Pilot Pendent Control)

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

6.4 Disposal

PROWINCH 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**
 - o Steel
 - o Nodular cast iron
- * **Non-ferrous metals**
 - o Bronze
- * **Plastics**
 - o Polyethylene
 - o Polyurethane
 - o Polyamide
 - o Natural rubber
 - o Epoxy resin
 - o Polyacetal
 - o Thermoset moulding compound
 - o (Asbestos-free brake lining)

Filter Silencer/Service Unit:

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

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.

PROWINCH 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 Chain Block Hoist.

7.1 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.

7.1.1 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.

7.1.2 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 sprung and must be replaced. Check hook support swivels for excessive clearance or damage. Ensure they swivel easily and smoothly.

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;

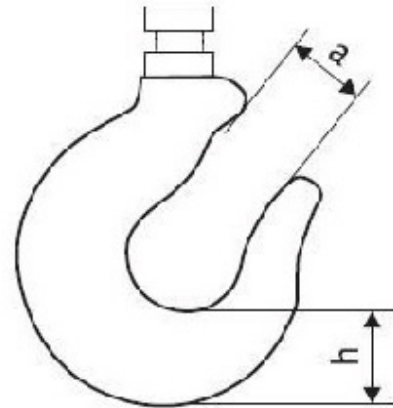


Figure 3: Hook wear sizes

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

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

7.1.4 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 bearingsurfaces between chain links (see Figure 3).

Replace a chain that fails any of the inspections. Check chain lubrication and lubricate if necessary. Refer to “Load Chain” in “Lubrication” Section 8.

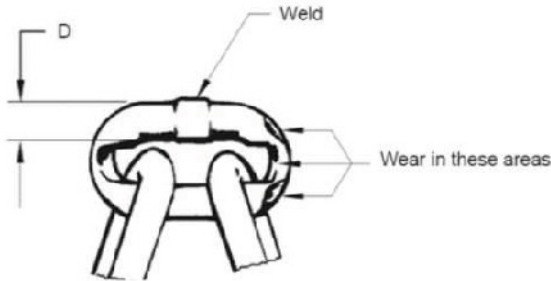


Figure 4: Chain Link

Danger: 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 7.2.10. The fatigue strength of chains is significantly impaired due to extreme corrosion (pitting corrosion). There is a danger of fracture. Hydrogen induced embrittlement with resultant stress cracks due to highly corrosive media (e.g. seawater) may affect high strength steels (e.g. chains). Danger of fracture! Particular care must be taken to properly inspect rusted chain for cracking if it has not been replaced.

7.1.5 Testing the Brake (Hoist and Trolley motor)

Test the brake function daily

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

Hook size	Stock Number*	Hook opening dimension+		Height dimension	
		Nom.	Max.	Nom.	Min.
0,5 - 2 ton	JS01365	27,0	29,7	27,0	25,7
3 ton	HS04442-1	33,0	36,3	37,9	36,0
5-6 ton	HS04440	41,5	45,7	47,0	44,7
10 ton	HS04443	58,0	63,8	60,0	57,0
16 ton	HS04444	66,0	72,6	67,0	63,7
20 ton	JS61101	87,0	95,7	80,0	76,0
25 ton	JS61001	71,0	78,1	85,0	80,8
50/60 ton	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 ATS 2000 for the appropriate sizes.					
+If safety catch fitted, subtract the thickness of the safety catch from the maximum hook opening dimension "a"					

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

7.1.6 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.

7.1.7 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 lead to failure of the bag and dropping of the load. This must therefore be avoided.

Chain Travel Buffers.

On PROWINCH 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 when pulled against the hoist. If the buffers are pulled against the hoist and the hoist stops, release the controls.

7.1.8 Air System

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

7.1.9 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 Hydraulic hoist specific supply requirements 3.9.

7.1.10 Controls

During operation of the hoist, check that the response of the hoist to the pendant is smooth and not sticky. Ensure that the control handle switches to its maximum position in both directions.

The control handle 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 EStop button, ensure that when activated hoist does not operate.

7.1.11 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.

Warning: Maintenance work on PROWINCH Trolleys must only be performed by trained and qualified personnel.

In the case of maintenance work exceeding normal service and maintenance, please contact PROWINCH.

7.2 Periodic Inspection

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". Also inspect the following:

7.2.1 Fasteners

Check cap screws and nuts. Replace if missing or tighten if loose – in accordance with Section 8.7.

7.2.2 All Components

Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates the need, disassemble. Check gears, shafts, bearing, load sheaves, chain guides, springs

and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.

7.2.3 Hooks

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

7.2.4 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.

7.2.5 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.

7.2.6 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 1mm.

7.2.7 Supporting Structure.

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

7.2.8 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.

7.2.9 Nameplate/Warning Stickers/Max Load Markings

Check for presence and legibility. Replace if necessary.

7.2.10 Load Chain and Anchors.

Ensure both ends of the load chain are securely attached to the hook swivel or chain stopper. Secure if loose, repair if damaged, replace if missing. Always use the load chain recommended by PROWINCH for the desired application. Measure the load chain for wear and stretching as shown below and compare to the allowable limits in Table 2. 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 exceed the maximum values shown below, replace the chain.

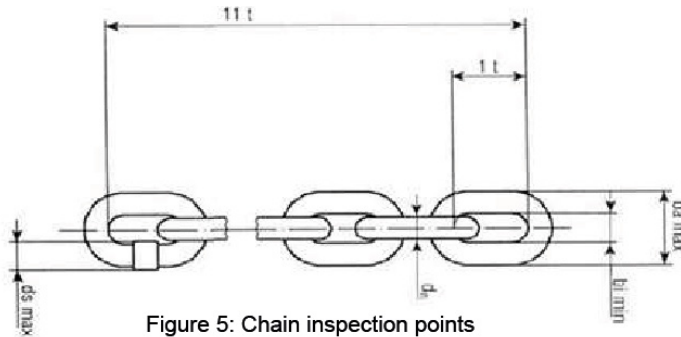


Figure 5: Chain inspection points

The chain must be checked for a reduction of the average wire diameter 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 made at an angle of 90° to each other as below.

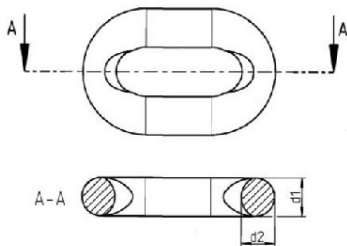


Figure 6 : Average wire diameter inspection points

Chain d x t	7x21	9x27	11.2x34	13x36	16x45	23.5x66
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
dm	≥ 6,3	≥ 8,1	≥ 10,08	≥ 11,7	≥ 14,4	≥ 21,15

Table 2: Allowable Chain Wear Sizes

7.3 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 hoist 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.

7.4 Cleaning and Care

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

7.5 Spare Parts

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

7.6 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.

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 associated components.

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

8.1 Air Motor

Coat all motor parts with a light film of SAE 10W or 27 – 32 centistoke or good quality hydraulic oil before assembling.

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

8.2 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.

Warning: *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.*

8.3 Load Chain

The load chain of PROWINCH 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 environment, 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 should be used in this instance.

8.4 Overload Protection

PROWINCH 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 capacity.

Danger: *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 1.5. And could lead to overload condition and dropped load.*

8.4.1 Delta P Load Limiter (HS50400CP)

Some PROWINCH Pneumatic hoists are fitted with Delta P load limiters which function by disrupting the air supply to the motor. When overload protection is triggered only the "Down" lowering operation can be initiated. 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.

In the event that the overload protection triggers under a loading deemed to be below the maximum capacity of the hoist it can be reset by briefly activating the "DOWN" lowering function. It is therefore recommended to always start a lifting cycle by briefly activating the "DOWN" lowering function. After which the "UP" lifting function can be activated.

Delta P Load Limiter - Overload Testing

If it is necessary to overload test the hoist, the Overload Protection can be bypassed by removing the locking cap screw.

Danger: *Once the overload test is complete the locking cap screw must be re-inserted and properly tightened until it seats firmly on the brass washer.*

The overload protection will not function if air is able to leak past the locking cap screw.

Delta P Load Limiter - Adjusting the Overload Protection

If it is necessary to overload test the hoist, the Overload Protection can be bypassed by removing the locking cap screw.

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.

Follow the below procedure to adjust the Overload Protection:

1. Loosen the retaining screw in order to reach the tensioning grub screw underneath it.
2. Turn the tensioning grub screw to adjust the overload protection setting. Turn the grub screw clockwise to increase the shutoff setting or counter clockwise to decrease the shutoff setting.
3. Replace the retaining screw and tighten it down until flush.

ATTENTION!

If the retaining screw is not properly tightened down the Overload Protection may function erratically.

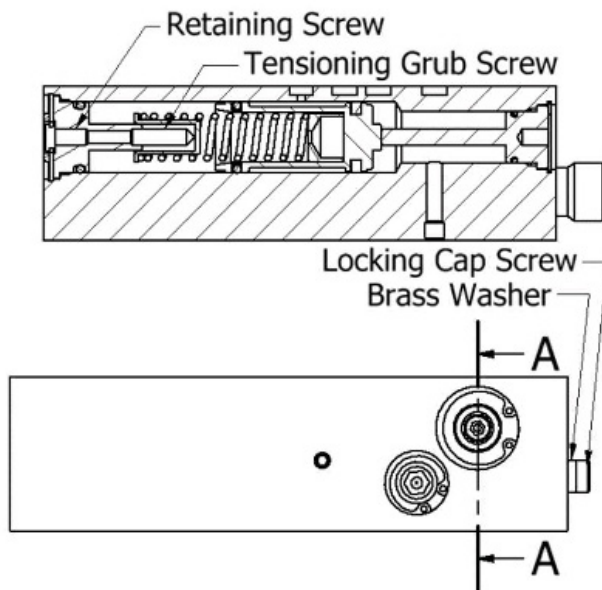


Figure 7: Diagram of load limiter

8.5 Mechanical Load limiter

Most PROWINCH hoists are fitted with mechanical load limiters. 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 PROWINCH for specific instructions.

8.6 Detailed Maintenance instructions

Contact PROWINCH for more specific instructions relating to the disassembly and maintenance of your hoist/trolley if required.

8.7 Bolt Torque Requirements

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

[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	

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

1. Definitions

Dry = Cadmium Plate, zinc plate, and oiled fasteners.

Lubricated = Moly sulfide paste, carnaba wax, moly sulfide 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 reference (for 8.8 and 10.9 fasteners) – **not applicable to stainless steel fasteners.**

9. Troubleshooting Table

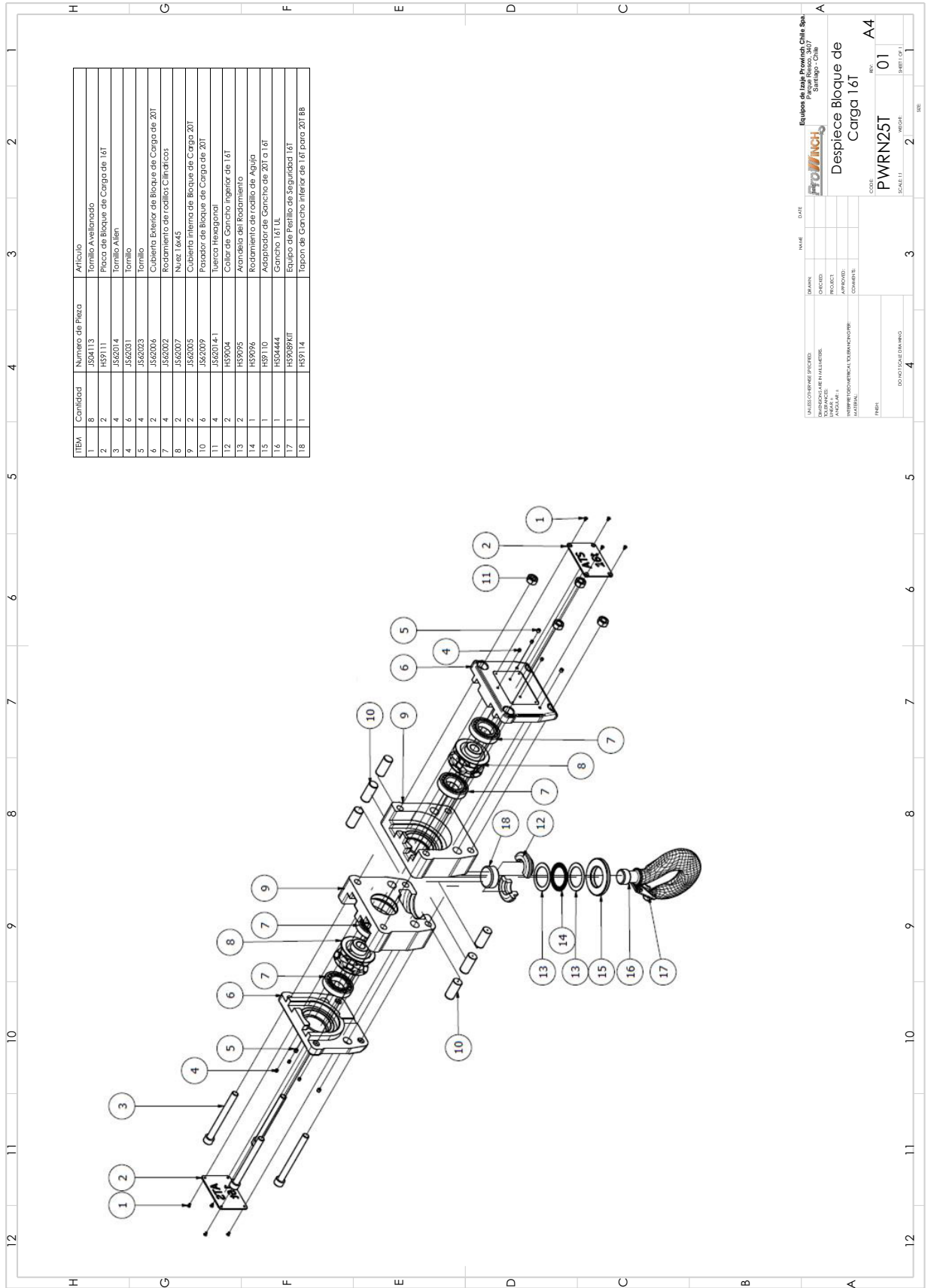
SYMPTOM	CAUSE	REMEDY
Lifting not possible	Supply pressure too low	Increase supply pressure to the relevant value.
	Emergency stop switch is pressed	Release emergency stop switch when danger is eliminated.
	Control is faulty	Have control repaired
Trolley cannot be moved	EMERGENCY STOP button pressed	If 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. Replace brake lining and or brake piston.
	Brake lining and/or brake piston worn	
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



10. Warranty

PROWINCH products are warranted to the original purchaser for a period of three (3) years after the date of purchase only to be free from defects in material and workmanship when subjected to normal, proper and intended use. Within this period, PROWINCH will only repair or replace free of charge any part on a product, after examination, is determined by PROWINCH to be defective in material or workmanship and was not caused or substantially contributed to by other factors or circumstances beyond PROWINCH control, including (but not limited to) defective installation, maintenance or repair, product modification or alteration, any neglect misuse or excessive use, mishandling, product exposure to extreme or unsuitable conditions, normal wear and tear or failure to follow manufacturer's instructions. This warranty does not apply to damage that PROWINCH determines to be from repairs made or attempted by anyone other than PROWINCH authorized personnel.

Return of the product with a copy of proof of purchase to PROWINCH, freight prepaid and insured, are required for this warranty to be effective. If more than one year has elapsed from purchase date, proof of periodic and regular maintenance by an authorized service must also be provided for this warranty to be effective. PROWINCH does not cover freight or labor charges associated with the inspection and testing of products which are found by PROWINCH not to be a valid warranty claim.

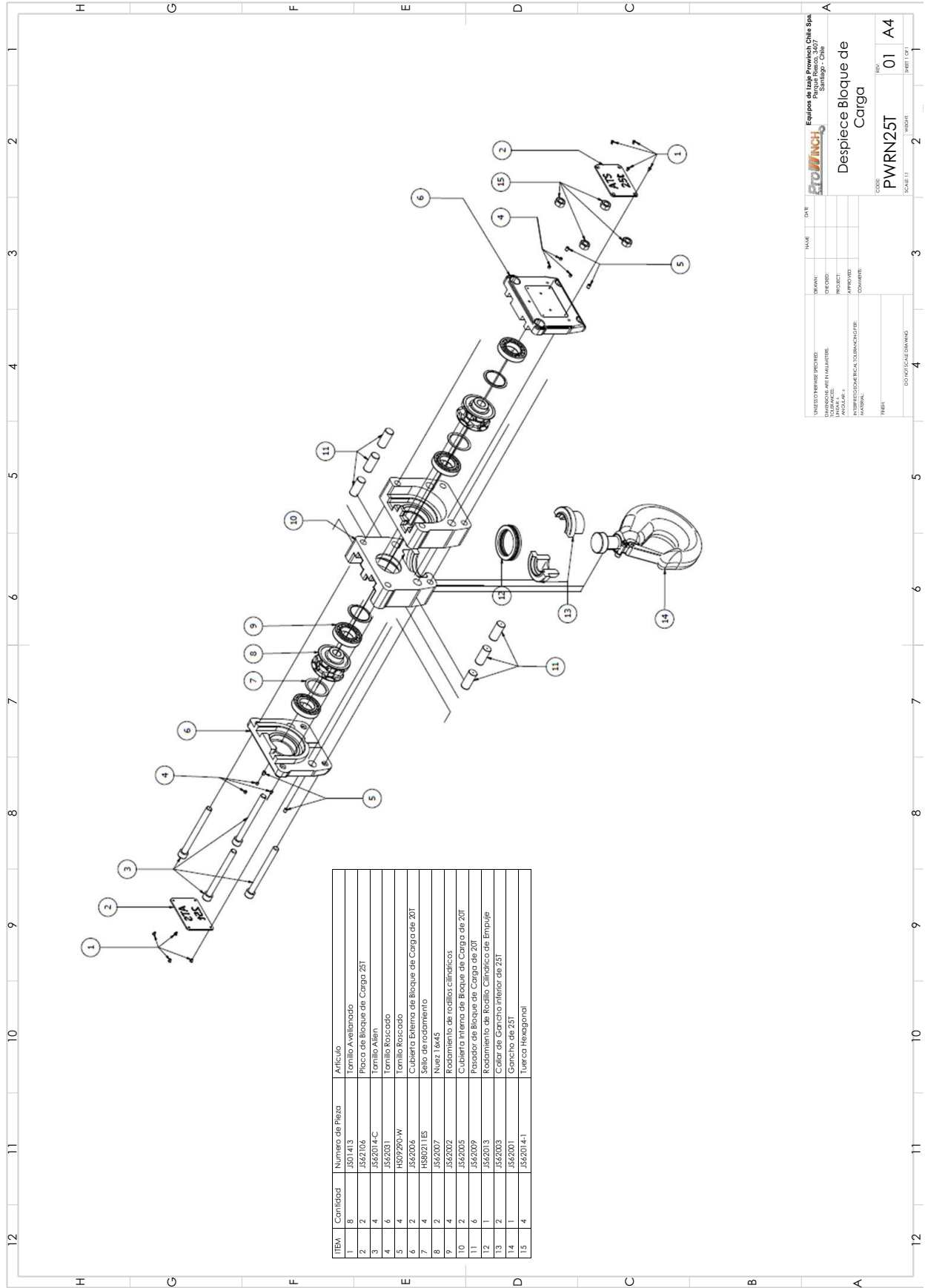



Equipo de Izaje Provench Chile Spa
 Paquín Benzo, 3407
 Santiago, Chile

Despiece Bloque de Carga 16T

CODE: **PWRN25T** REV: **01** A4
 SCALE: 1:1 SHEET: 2 OF 2

INFORMACION GENERAL	DATE
DRAWN: _____ CHECKED: _____ PROJECT: _____ APPROVED: _____ MATERIAL: _____ COMMENTS: _____	NAME: _____ DATE: _____



ITEM	Cantidad	Numero de Pieza	Artículo
1	8	1501413	Tomillo Avellanado
2	2	1521016	Placa de Bloque de Carga 25T
3	4	1522014-C	Tomillo Allen
4	4	1522031	Tomillo Roscado
5	4	1522200-W	Tomillo Roscado
6	2	1522016	Cubierta Externa de Bloque de Carga de 20T
7	4	1522115	Sello de rodamiento
8	2	1522007	Nuez 18x45
9	2	1522002	Rodamiento de rodillos cilíndricos
10	2	1522005	Cubierta Interna de Bloque de Carga de 20T
11	6	1522009	Pasador de Bloque de Carga de 20T
12	1	1522013	Rodamiento de Rodillo Cilíndrico de Empuje
13	2	1522003	Color de Gancho Interior de 25T
14	1	1522001	Gancho de 25T
15	4	1522014-1	Tuerca Hexagonal

Prowinch Equipos de Izaje Prowinch Chile Spa
Santiago, Chile

DESIGNADO POR: []
DISEÑADO POR: []
APROBADO POR: []
CORRECCIONES: []
AUTOR: []
INSTRUMENTACIÓN, DIMENSIONES Y MATERIALES: []
REVISIÓN: []
FECHA: []

DESCRIPCIÓN DEL DISEÑO: Despiece Bloque de Carga

MODELO: PWRN25T

ESCALA: 1:1

HOJA: 01

TOTAL: A4

PROYECTISTA: []

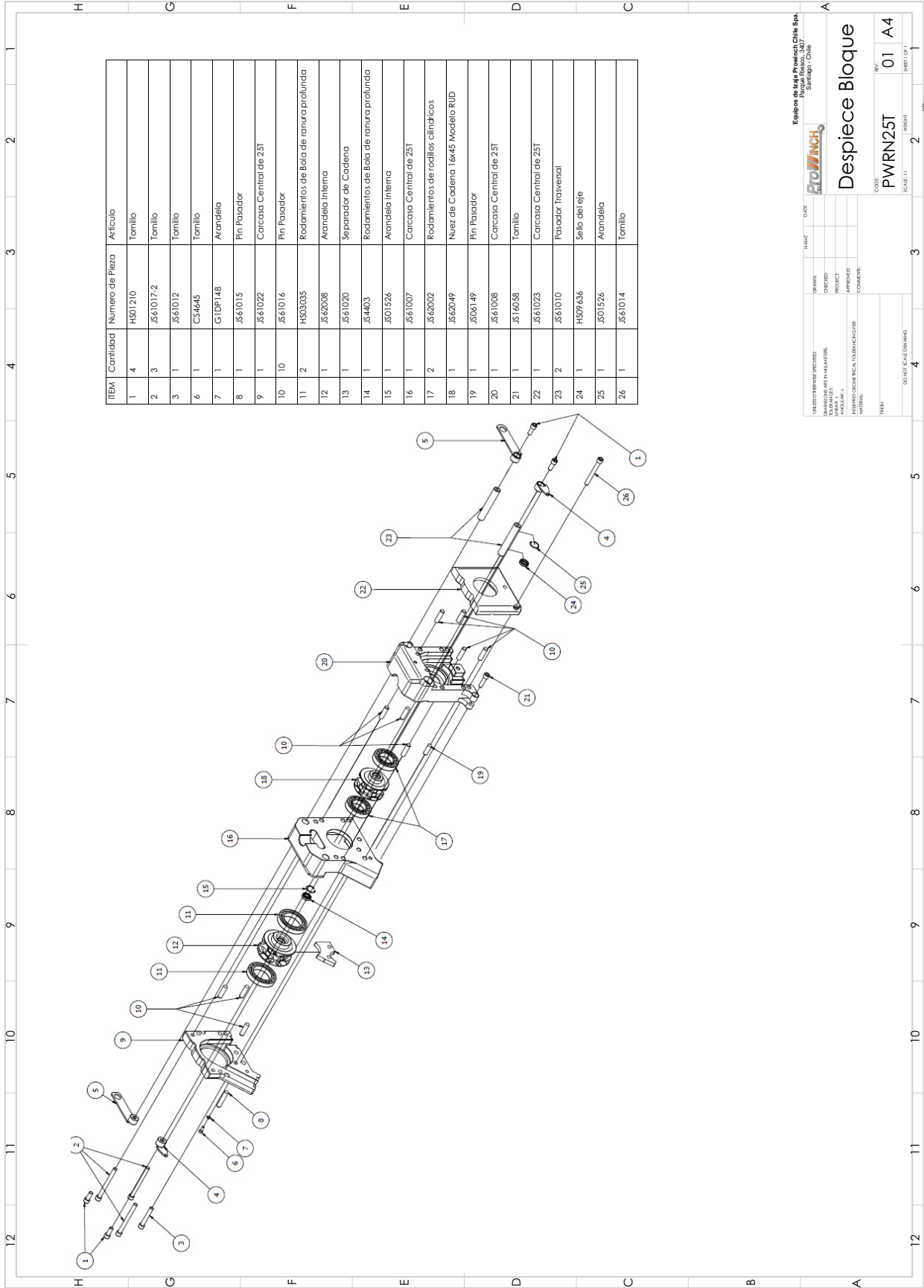
REVISOR: []

APROBADO: []

INSTRUMENTACIÓN: []

REVISIÓN: []

FECHA: []



ITEM	Cantidad	Numero de Pieza	Articulo
1	4	H801210	Tornillo
2	3	36.610.17.2	Tornillo
3	1	36.610.12	Tornillo
6	1	CS4645	Tornillo
7	1	G1DPT148	Arandela
8	1	36.610.15	Pin Pasador
9	1	36.610.22	Carcasa Central de 25T
10	10	36.610.16	Pin Pasador
11	2	H503035	Rodamientos de bola de ranura profunda
12	1	36.620.08	Arandela Interna
13	1	36.610.20	Separador de Cadena
14	1	36.440.3	Rodamientos de bola de ranura profunda
15	1	36.015.26	Arandela Interna
16	1	36.610.07	Carcasa Central de 25T
17	2	36.620.02	Rodamientos de rodillos cilindricos
18	1	36.620.49	Nuez de Cadena 1&45 Modelo RUD
19	1	36.061.49	Pin Pasador
20	1	36.610.08	Carcasa Central de 25T
21	1	36.160.58	Tornillo
22	1	36.610.23	Carcasa Central de 25T
23	2	36.610.10	Pasador Transversal
24	1	H509.636	Sello del eje
25	1	36.015.26	Arandela
26	1	36.610.14	Tornillo

Equipos de Izaje Prowinch Chile Spa.
Prowinch Chile
Santiago - Chile

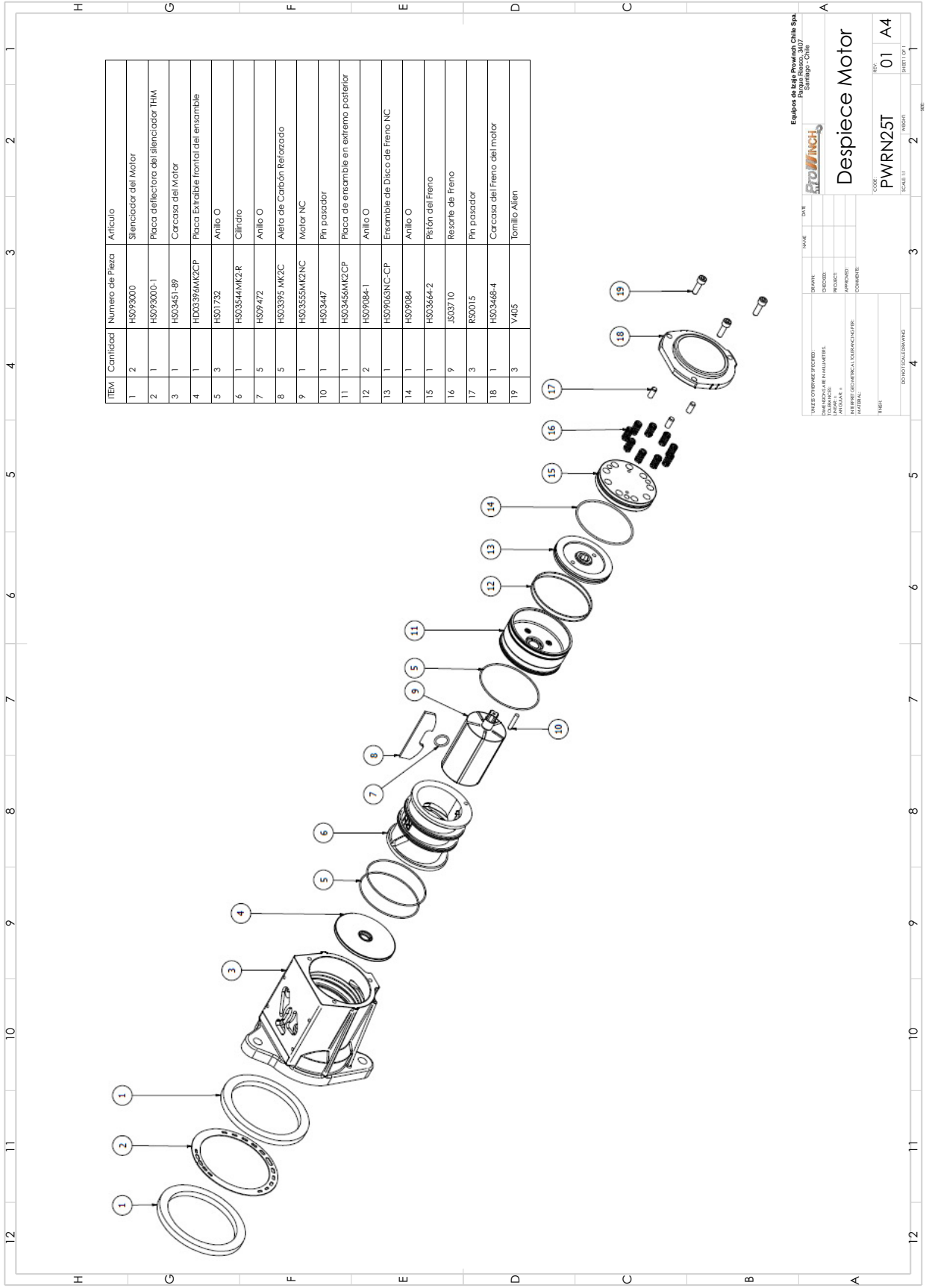


Despiece Bloque

ITEM: _____ UNIT: _____
 DRAWN: _____
 CHECKED: _____
 DESIGNED: _____
 APPROVED: _____
 COMMENTS: _____
 PREPARED BY: _____
 DATE: _____

COORD: PWRN25T 01 A4
 SCALE: 1:1 PART OF 1

BOZOSI SCALE DRAWING



ITEM	Cantidad	Numero de Pieza	Artículo
1	2	HS093000	Silenciador del Motor
2	1	HS093000-1	Placa deflectora del silenciador THM
3	1	HS03451-89	Carcasa del Motor
4	1	HD03396MK2CP	Placa Extraíble frontal del ensamble
5	3	HS01732	Anillo O
6	1	HS03544MK2R	Cilindro
7	5	HS09472	Anillo O
8	5	HS03395 MK2C	Aleria de Carbón Relajado
9	1	HS03553MK2NC	Motor NC
10	1	HS03447	Pin pasador
11	1	HS03456MK2CP	Placa de ensamble en extremo posterior
12	2	HS09084-1	Anillo O
13	1	HS09063NC-CP	Ensamble de Disco de Freno NC
14	1	HS09084	Anillo O
15	1	HS03464-2	Pistón del Freno
16	9	JS03710	Resorte de Freno
17	3	RS0015	Pin pasador
18	1	HS03468-4	Carcasa del Freno del motor
19	3	V405	Tornillo Allen

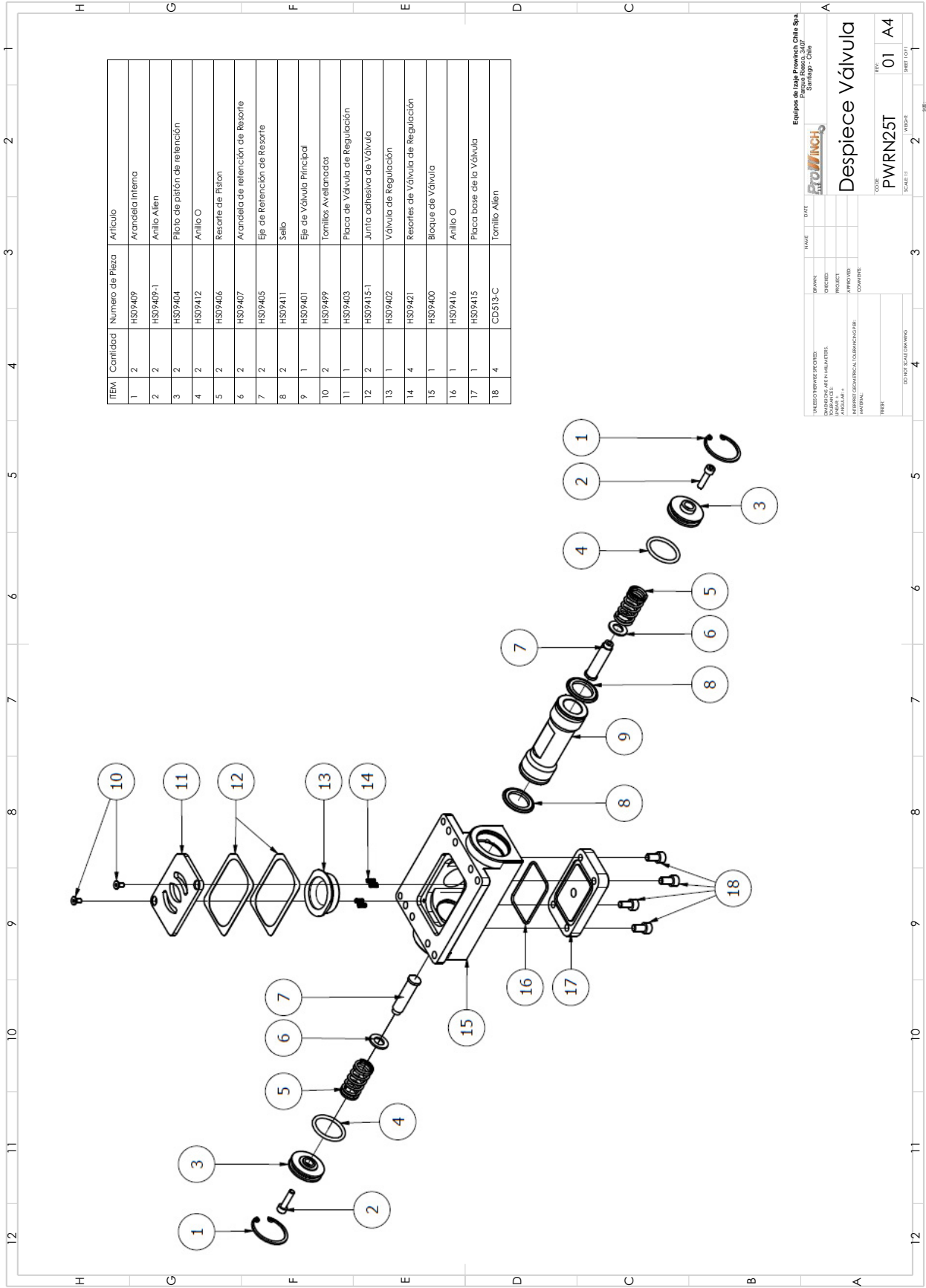
Equipo de la Empresa Powermax Chile Spa.
 Calle 12 N° 300
 Santiago, Chile

ProMach

Despiece Motor

BRAND: _____ DATE: _____
 DRAWN: _____
 CHECKED: _____
 DESIGNED: _____
 MATERIAL: _____
 APPROVAL: _____
 MATERIAL: _____
 COMMENTS: _____
 PART: _____

CODE: **PWRN25T** REV: **01** A4
 SCALE: 1:1 SHEET 1 OF 1



ITEM	Cantidad	Numero de Pieza	Artículo
1	2	H507409	Arandela Interna
2	2	H507409-1	Anillo Allen
3	2	H507404	Piloto de pistón de retención
4	2	H507412	Anillo O
5	2	H507406	Resorte de Piston
6	2	H507407	Arandela de retención de Resorte
7	2	H507405	Eje de Retención de Resorte
8	2	H507411	Sello
9	1	H507401	Eje de Válvula Principal
10	2	H507499	Tomillos Avellanados
11	1	H507403	Placa de Válvula de Regulación
12	2	H507415-1	Junta adhesiva de Válvula
13	1	H507402	Válvula de Regulación
14	4	H507421	Resortes de Válvula de Regulación
15	1	H507400	Bloque de Válvula
16	1	H507416	Anillo O
17	1	H507415	Placa base de la Válvula
18	4	CD513-C	Tomillo Allen

Equipos de Izaje Prowinch Chile Spa
Piquero Riesco, 3407
Santiago - Chile



Despiece Válvula

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