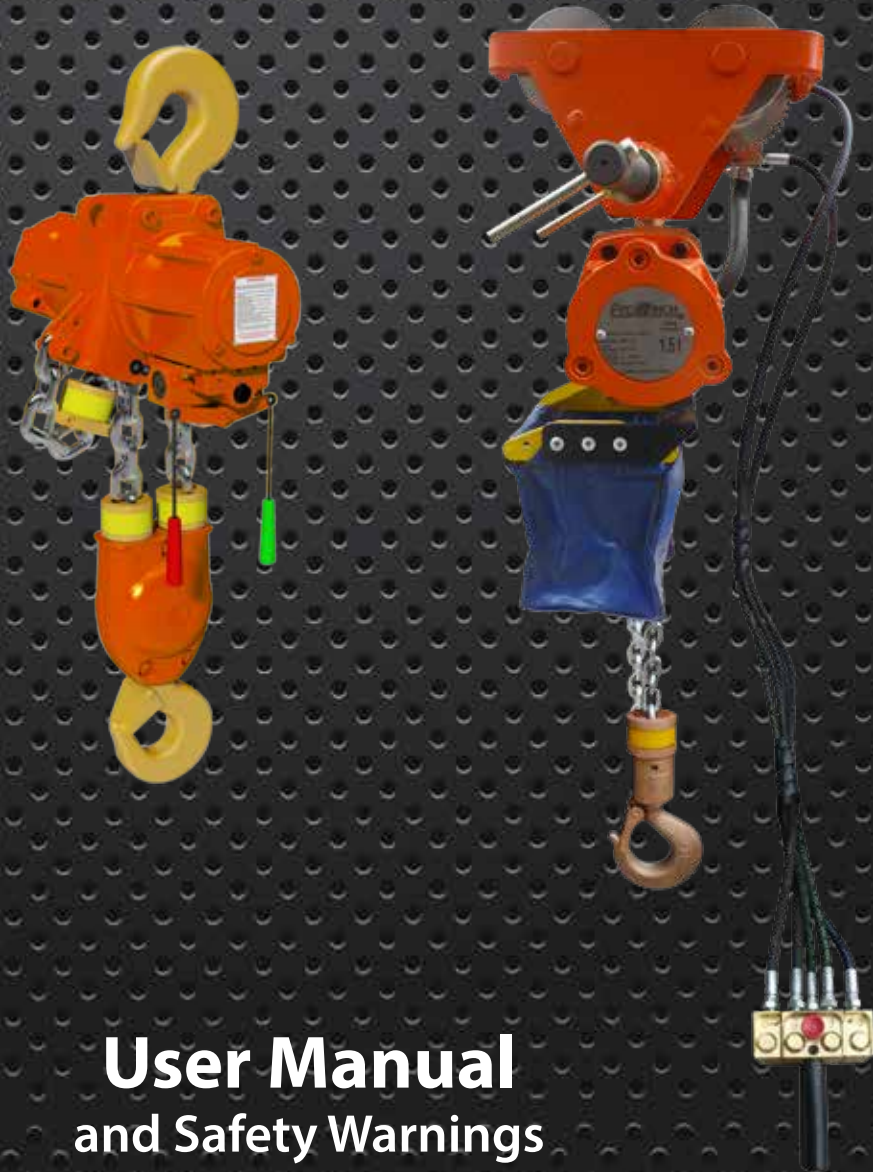


# ProWINCH



**User Manual**  
and Safety Warnings

**PWRN / PWRCN**

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PROWINCH LLC COMPANY WITH QUALITY MANAGEMENT SYSTEM



## DISCLAIMERS

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### PROWINCH® HOIST

Prowinch LLC. states that has given the customer all possible safety warnings related to the acquired equipment, so, in behalf of that, does not assume any responsibility for any problems or injuries that the customer or third parties may suffer if caused by 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](http://www.prowinch.com) for the latest information regarding this equipment.

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## 1. MODEL

PWRN / PWRCN





“ Thank you for purchasing our Prowinch® Electric Chain Hoist. This manual provides important information for personnel involved with the installation, operation and maintenance of this product. It is strongly recommended that you read this manual before installing, operating or maintaining the product. ”

## 2. GENERAL SAFETY INSTRUCTIONS

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Prowinch's Hoist is designed for delivering a safe and trustable service if it's operated according to the instructions manual. Respect all warnings for personnel and third party safety. The inadequate operation of the equipment may cause injuries or harm the equipment. Read and understand this manual carefully before installation and commissioning of the equipment. Keep this manual in a visible place for any consultation if needed.

With a compact structure, light weight and ease of use, PWRN and PRWCN models are preferred hoist for daily use in factories, mines, sea port and warehouses.

The hoist may offer a great deal of strength. If it's not used the right way may produce harm to users and may end up in wounds, injuries or death. In this manual you can find symbols for caution, warnings or danger. Always consider the notes beside the symbols for your own safety. A safety operation of this manual depends on you, the operator.

**Mandatory use of:**





#### DANGER

All operators and other users who are near the steel chain or near its load projection, must wear the safety equipment for this equipment. This includes gloves, helmet, safety shoes and eyes protection.

### 3. SAFETY INFORMATION

This manual will refer to existing legal requirements and engineering practices as known when this document was written. Should any such legislation or practices 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.

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 equipment must be competent, careful, physically and mentally qualified, and trained in the safe operation of equipment and the handling of the loads. Serious hazards are 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 for which it was not intended or designed. The above can lead to fatal consequences.

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

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

PWRCN 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 various conditions of the equipment or material can vary depending on the environment they are used in which may cause corrosion or wear and any other variables that may arise in each individual application. It is in the light of this that the hoist be maintained and repaired under the supervision of a competent person:

1. Who is qualified by virtue of his knowledge, training, skills and experience to organize the work and its performance?
2. Who is familiar with the legal requirements which apply to the work to be performed?
3. Who has been trained to recognize any potential or actual danger to health and safety in the performance of the work?

The instructions given in this manual must be interpreted accordingly and sound judgment used in determining their application. This operation manual is intended to help the operator to become familiar with PWRCN trolleys and how to use them properly. This operation manual contains important information for the safe, proper and efficient operation of PWRCN Air hoists. Observance of the manual helps to avoid hazardous situations, to reduce repair costs and downtimes and to ensure the specified service life of the PWRCN Air Hoists.

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

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

### Danger, Warning and Notice

Throughout this manual there are steps and procedures which, if not followed, may result in an injury. The following signal words are 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 is used to indicate the presence of a hazard which can cause severe injury, death, or substantial property damage if the warning is ignored.



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



This symbol points out important safety instructions which if not followed could endanger the personal safety and/or property of yourself and others. Read and follow all instructions in this Operating Manual and any provided with the equipment before attempting to operate your electric chain hoist.

## 4. SAFETY SUMMARY

### **WARNING**

- Do not use this trolley or any equipment attached to it for lifting, supporting, or transporting people or lifting or supporting loads over people.
- Prowinch PWRN/PWRCN series of trolleys are designed to provide a MINIMUM of 5 to 1 safety factor. It is the responsibility of the customer to ensure that the structure to which the hoist is attached and any load attaching devices are capable of handling the static and dynamic loads imposed on the structure by the hoist and its attachments when lifting the rated load. If in doubt, consult a registered professional structural engineer.

### **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.

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.

PWRCN industrial and mining air 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 –

(a) ensure, as far as is reasonably practicable, that the substance is safe and without risks to health when properly used; and

(b) 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, 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 PWRCN 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 is 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.

PWRCN 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 or step, personnel should place the product in a safe condition and contact supervisors and/or the factory for technical assistance.

## 5. MAIN COMPONENTS

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

- Side plates
- Rolling wheels
- Distance spacers
- Load bolts/clevis load bar
- Air motor drive, reel chain drive (fore running wheels or rack and pinion)

Exception: no drive with manual trolleys.

## 6. PRODUCT DESCRIPTION

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

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

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

PWRCN lifting gear and low headroom trolleys have this rigid connection only. For ultra-low (UL) configurations please see the UL Installation and operation manual.

PWRCN trolleys are moved according to their construction:

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

The operating pressure of the traversing motors is adapted in accordance with the operating pressure of the corresponding hoist (see nameplate). PWRCN trolleys are designed in accordance with DIN15018 and correspond to stress group B4, lifting group H2.

They are suitable for girders according to DIN 1025 or similar types of girder.

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

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

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

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

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

Special PWRCN trolley models can be delivered with:

- Extra low height for low headroom trolley
- Rack-and-pinion drive for form-fitting power transmission
- Locking device for fixing in a certain position
- Two travel speeds
- Infinitely variable travel speed
- Pneumatic end switches for limiting the movement increased spark protection (as described below) in case of especially high requirements for explosion protection
- Cleaning of the exhaust air by filter silencers
- Throttle control for reducing the maximum travel speed

## **7. INTENDED USE**

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

Any other use or use outside these stipulations is deemed to be impermissible. For applications requiring this type of use please consider the PWRCN range of winches and the Prowinch Rigga range of hoists. PWRCN 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 of loads
- Sliding loads
- Detaching, dragging or pulling of loads
- Catching of falling loads
- Carrying people
- Jog control over longer distances
- Switching to the opposite direction with load in motion
- Operation reaching of the end stop

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

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

## 8. OPERATING CONDITIONS

PWRCN Air 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  $-20^{\circ}\text{C}$  up to approx.  $+70^{\circ}\text{C}$  if they are not heated above this level due to external influences. The thermal endurance of chains and hooks is  $+150^{\circ}\text{C}$ .



When touching metallic hand controls which are colder than  $0^{\circ}\text{C}$ , skin could freeze within a few seconds, and at temperatures above  $43^{\circ}\text{C}$ , burns may occur. As a protective measure, please wear suitable gloves.

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

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

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



### 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.

PWRCN 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  $40\ \mu\text{m}$
  - Particle density less than  $10\ \text{mg}/\text{m}^3$
- (corresponds to Class 7 in accordance with ISO 8573-1:2001)

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

Also see Lubricants.

- Pressure dew point at least  $10^{\circ}\text{C}$  below the lowest expected ambient temperature

## **Do not operate PWRCN 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 unity with oiler,
- Adding anti-icing agent to the lubrication oil (depending upon moisture content of compressed air),
- Or using air motor oil (Art. No. 11900) with anti-icing agent for relevant temperatures.

## **9. TRANSPORT AND STORAGE**

### **Safe Transportation**

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

- Carefully dismount trolley.
- Set the entire hoist down carefully; do not allow it to drop. For weights see Technical data, page 45.
- 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.

## **10. STORAGE CONDITIONS**

### **Breaks in Operation**

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

### **Storage**

- If the hoist is to be stored for a long time, 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 compensate for the slight delay of the oil coming from the lubricator, and stop moisture rusting the bearings.
- Plug hoist air inlet port.
- Always store the hoist in a no load condition.
- Wipe of all dirt and water.
- Oil the load chain, hook pins and hook latch.
- Store the hoist in a clean dry environment.
- Before returning the hoist to service, follow instructions for hoists not in regular service in the "INSPECTION" section.

## 11. INITIAL OPERATION

The four most important aspects of hoist operation are:

- 1. Follow all safety instructions when operating hoist.
- 2. Allow only people trained in safety and operation of this product to operate hoist.
- 3. Subject each hoist to a regular inspection and maintenance as outlined in this manual under the section 'Inspection'.
- 4. Be aware of the hoist capacity and weight of load at all times.

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.

### a) Mounting the Trolley



PWRCN trolleys must only be installed by qualified personnel. Faulty installation can lead to serious accidents.



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

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

Dynamic tractive forces have to be considered.

PWRCN trolleys are designed for running girder profiles in accordance with DIN 102 or similar profiles.

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

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

Please supply adequate working tools.

Please look for a safe place for the mounting personnel.

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

### **Mounting Motorised Trolleys (LM), Reel Chain Trolleys (LH) and Manual Trolleys (LN) with Clevis Load Bar (up to 2 tons carrying capacity)**

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

### **Mounting Trolleys with Clevis Load Bar into Girders with Open Ends**

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

The running gear can now be mounted into the track girder by pushing the running gear onto the girder so that the running wheels roll on the bottom flange.

After mounting, the clearance between the outer edge of the bottom flange of the girder and the wheel flange must be between 1 and 1.5 mm on either side.



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

### **Mounting Trolleys with Clevis Load Bar into Girders with Closed Ends**

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



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

#### **Correct:**

After the running gear width has been adjusted, the clevis of the load bar must be positioned to the girder as shown in figure 6.

The load hook of the lifting equipment can now be attached to the clevis.



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

### **Mounting Trolleys with Load Bolt (Over 2 tons Carrying Capacity) into Girders with Open Ends**

- Mount the trolley at one end of the girder. For rack-and-pinion drive, the drive pinion is to be lowered first in order to be released from the rack and pinion.
- Secure both ends of the girder with end stops to prevent the trolley from falling. They must be designed for the impact load occurring in the event of a collision, with full load and full speed.
- The end stops have to be equipped with a buffer. We recommend our clamping buffers. For rack-and-pinion drive, engage the drive pinion (see section Adjusting the rack-and-pinion drive).
- The hexagonal nuts 1,2 of the distance spacers 3 and the load bolt 4 at the rear side plate 6 have to be loosened so far that the trolley can be pushed over the bottom flange of the girder. If necessary, the rear side plate including the outer distance washers 7 have to be completely dismantled. For rack-and-pinion drive, the drive pinion is to be lowered first in order to be released from the rack and pinion.
- In the case of running gears without distance spacers, the retaining rings must be removed from the hexagonal nuts 2 of the load bolts and the hexagonal nuts 2 at the rear side section must be loosened so far that the trolley can be pushed over the bottom flange of the girder. If necessary, the rear side plate must be completely dismantled.
- Position the trolley (possibly including the hoist) with running wheels of the front side plate on the bottom flange of the girder.
- Thread on and tighten the rear side plate using washer sets (see section Screw retainers and torques, page 43).

### **ATTENTION!**

Please pay attention to the position and number of the locking rings and distance washers that fasten the hoist to the middle of the trolley.

- Connecting the controls (see the section Connecting the controls, page 25). For rack-and-pinion drive, engage the drive pinion (see section Adjusting the rack-and-pinion drive).

### **After mounting please check**

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

### **b) 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 as described.



### **c) Connecting the Controls**

#### **Connecting the Control Hoses**

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

#### **d) Removing the Hose Pieces**

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

1 Air connection on the left

2 Main air connection

3 Air connection 2nd travel speed

4 Control port on the right

#### **ATTENTION!**

Please ensure that the hose is not bent when inserted.

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

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

#### **e) Connecting to the Main Air Supply**

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

#### **f) 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 associated components.

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



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

2. Apply a coating of grease to all gearing before assembly. Neglect of proper lubrication will lead to bearing 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.

## **12. STARTING OPERATION**

If the trolley is operating with an PWRCN Hoist, the operation manual of the mounted hoist/hoist system has to be observed before putting into operation, the section Pre-start checks also applies.

### **a) 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 deficiency revealed through inspection must be reported to an appointed person. A determination must be made as to whether a deficiency constitutes a safety hazard before resuming operation of the hoist.

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

### **b) Inspection before Initial Operation**

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

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

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

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.

### c) 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.

#### 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. Check chain feed through the chain guides and undercarriage. If chain jams, wedges, jumps are 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.

#### 2. Hooks.

Check for wear or damage, increased throat width, bent shank or twisting of the hook. Replace hooks which exceed the throat opening specified in Table 2 or exceed a 10 degrees twist (see Figure 4). 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.

| HOOK RATING<br>RATING | Maximum permissible<br>hook opening<br>dimension “a” (mm)** | Minimum permissible<br>height<br>dimension “h” (mm) |
|-----------------------|---|---|
| 0.5 - 2 Ton           | 31  | 25.6  |
| 3 Ton                 | 35.7  | 36.1  |
| 5 - 6 Ton             | 46  | 44.7  |
| 10 Ton                | 50.4  | 58.9  |
| 16 Ton                | 66  | 67  |

\*\* If safety catch fitted, subtract the thickness of the safety catch from the maximum hook opening dim “a”

Hook dimensions and wear limits

#### 3. Hook Travel Buffers.

The hook travel buffers are securely attached to either end of the load chain. When functioning as hook travel limits they operate in conjunction with the load limiter which stops the air motor when pulled against the hoist. If the buffers are pulled against the hoist and the hoist stops, release the controls and listen for the sound of the load limiter valve resetting as it exhausts a small amount of air.

#### 4. Air System.

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

#### 5. Controls.

During operation of the hoist, check 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 E-Stop button, ensure when activated hoist does not operate.

#### 6. Hook Safety Latch.

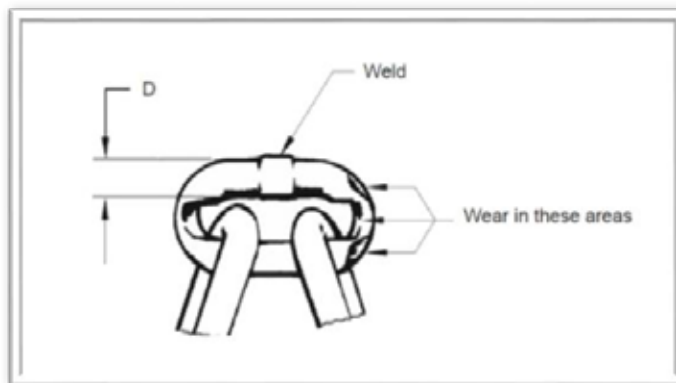
Make sure the hook safety latch is present and operating properly. Replace if necessary.



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

#### 7. 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 5). Replace a chain that fails any of the inspections. Check chain lubrication and lubricate if necessary. Refer to "LOAD CHAIN" in "LUBRICATION" section.



- **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".**

#### 8. Load Chain Reeving.

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

#### Daily Inspection for Machines Operated in Corrosive Environments

If the machine 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.

## 13. OPERATION

### Rules for the Safe Operation of Trolleys

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

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

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

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

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

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

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

## 14. CONTROLS

### Pilot Pendent Control

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 pilot pendent control allows for precise spotting and variable speed control and has arrows indicating the direction of movement of the lower hook and the trolley. The harder the pendent buttons are pressed the faster the hoist or trolley will operate. When the buttons are released, the control valve shuts off the air supply to the hoist thereby applying the brake and stopping the hoist.

### Emergency Stop

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

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

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

## 15. TAKING OUT OF OPERATION

### Shutting Down

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

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

### Dismantling



PWRCN Air Hoists must only be dismantled by qualified personnel.



**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.

### Dismantle 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.

### Disposal

PWRCN 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

## 16. MAINTENANCE

### a) General

#### Maintenance and Inspection Intervals

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



Maintenance work on PWRCN trolleys must only be performed by trained and qualified personnel. In the case of maintenance work exceeding normal service and maintenance, please contact PWRCN. For information regarding qualification of maintenance personnel, see the section Personnel safety, page 5.

#### Cleaning and Care

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

#### Spare Parts

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

#### Inspection and Repairs

PWRCN 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 this hoist.

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 deficiency revealed through inspection must be reported to an appointed person. A determination must be made as to whether a deficiency constitutes a safety hazard before resuming operation of the hoist.

## b) MOTOR

### Introduction

This document serves to outline the way in which we at Prowinch assembles and disassembles the pneumatic small motor (HS03450SMC). This is to standardise the way the small motor is assembled.

### Responsibility of the service engineer

When an engineer undertakes the examination or repair of a hoist, they are taking on a heavy responsibility. The future safety of people who operate the hoist will depend on their careful and deliberate workmanship.

For this reason, it is essential that only genuine Prowinch spare parts are used. Although it may be possible to fit components from other sources, it is impossible to be certain that they are built to the same high standard and are of comparable strength and durability.

Apart from ensuring safe operation, the use of Prowinch spare parts also results in genuine long-term financial economical savings.

### Assembly of the air motor

This section will provide a step by step guide on how to assemble the Prowinch air hoist motor, HS03450SMC.

#### Step 1:

Remove the wire from the rear end plate assembly, as seen in Figure 1a and fit greased o-rings as seen in Figure 1b. Note that the rear end plate spacer and rear end plate are a matched set and cannot be separated.



Figure 1a: Rear End Plate Assembly



Figure 1b: O-ring Placement



Step 2:

Insert alignment dowel pins, HS03447, into cylinder and ensure that they sit tangent to the flange, as seen in Figure 2. Insert greased o-ring, HS01732, into the groove.

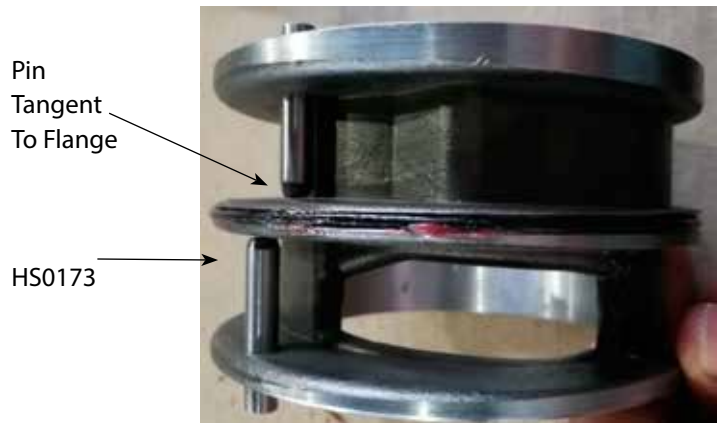


Figure 2: Cylinder Assembly

Step 3:

Assemble the cylinder into the rear end plate assembly. This step requires knowledge of the required bias for the motor. There are three different settings: left hand biased, right hand biased and straight. The settings are indicated in Figure 3a. Insert the pin, indicated as "High" in Figure 3b into the hole of the desired bias setting.



Figure 3a: Cylinder Biased Setting

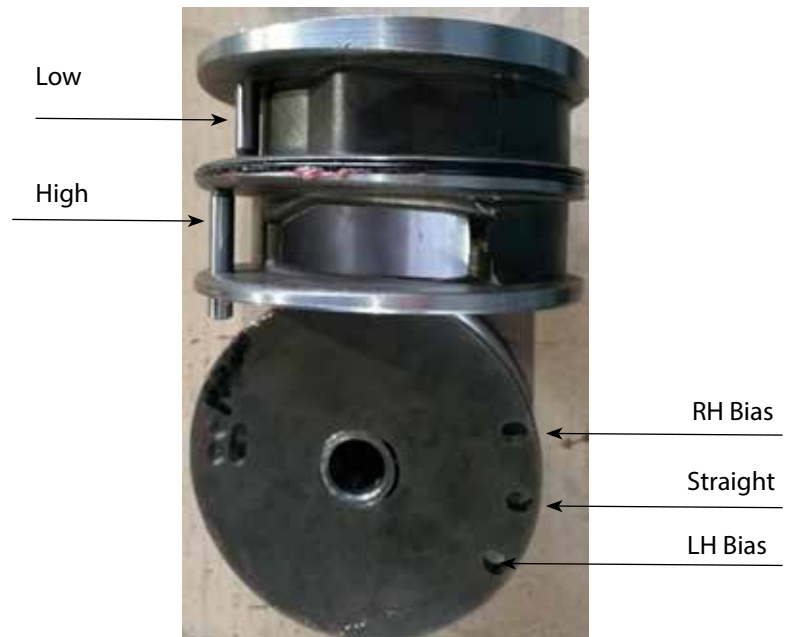


Figure 3b: Cylinder Biased Setting

Step 4:

Insert the rotor, HS03555-NC, into the assembly. Ensure that the orientation of the rotor is correct, with the female coupling detail of the rotor pointing upwards, as indicated in Figure 4.

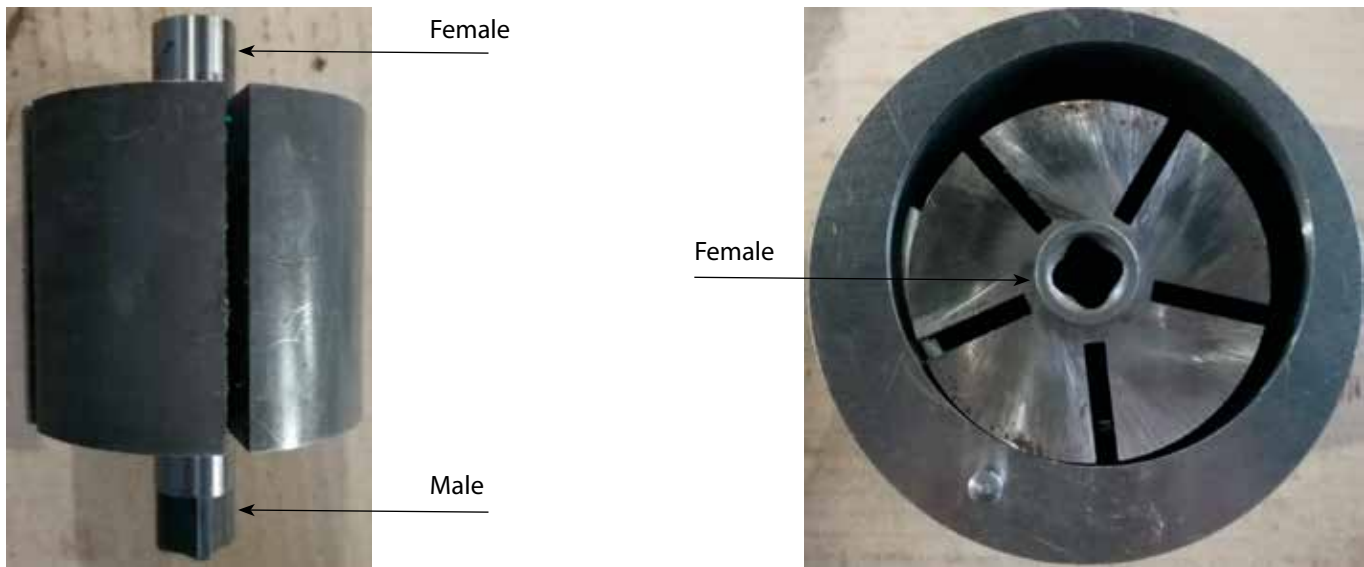


Figure 4: Rotor Orientation

Step 5:

Insert the rotor vanes, HS03395W-1CAR, and o-rings, HS09472, into the rotor as indicated in Figure 5. To ease assembly, rotate the rotor after inserting each o-ring and vane to ensure that the vanes and o-rings are seated correctly.



Figure 5: Rotor Vanes and O-Rings

**Step 6:**

Remove the wire from the front end plate assembly, HS03396MK2CP-W, and place the assembly on to the cylinder. Ensure that the pin location is the same as the rear end plate. The configuration in Figure 6 is for the left hand biased setup.

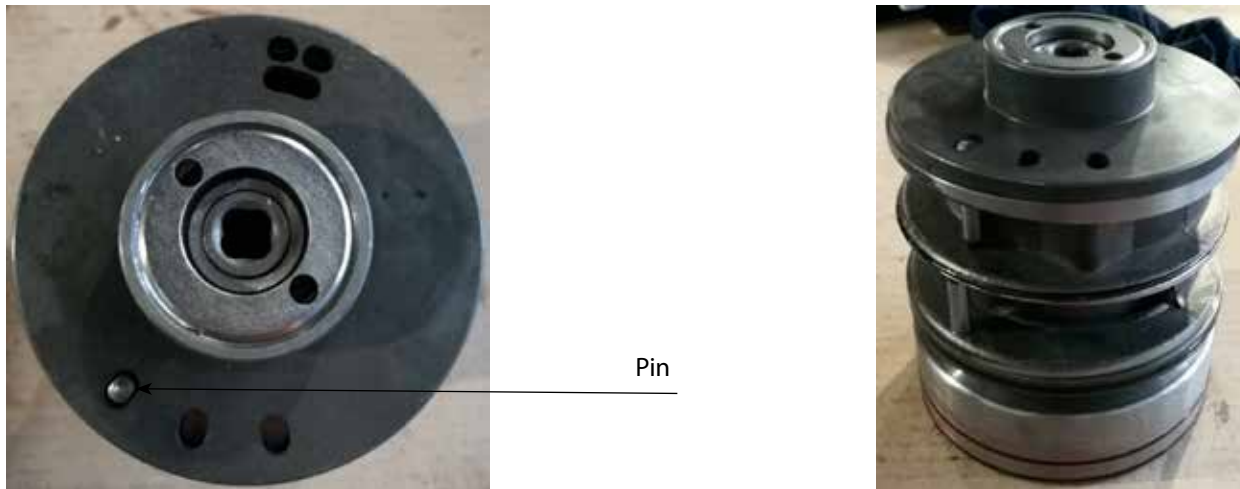


Figure 6: Front End Plate Assembly

**Step 7:**

First align the pin in the front end plate with the centre of the motor housing, as shown in Figure 7. Place the motor housing, HS03451W, over the assembly and use a rubber mallet to ensure that the front end plate sits flush against the shoulder of the motor housing.



Figure 7: Motor Housing Alignment

Step 8:

Flip the motor assembly over as shown in Figure 8a. Insert the nc brake disc assembly, HS09063NC-CP, as in Figure 8b.



Figure 8a: Motor Assembly (no Brake Disc)



Figure 8b: Motor Assembly (with Brake Disc)

Step 9:

Grease the brake piston o-ring, HS09084, and place over the brake piston, HS03664-2, as shown in Figure 9.



Figure 9: Brake Piston O-Ring Assembly

Insert the brake piston with the o-ring into the brake housing, with the spring recesses facing outward. Note that the o-ring will bulge out and catch on the housing, as shown in Figure 10. Use your fingers to push the o-ring back in and apply pressure to the back of the piston. Do not use a hammer to hit the piston in.



Figure 10: Brake Piston Assembly

Step 10:

Use a hammer to knock the dowel pins, RS0015, into the brake cover, HS03468-3. Ensure that the pins are fully in.



Figure 11: Brake Cover

Step 11:

Insert the springs into the brake piston, align the brake cover pins with the three open holes in the brake piston. Rotate the brake cover until the cap screw holes line up with those in the motor housing, insert and tighten the cap screws. Note that when tightening the cap screws, tighten them evenly to prevent missalignment.



Figure 12: Brake piston Spring

Step 12:

Insert the silencer baffle, JS01582, and then the knitted silencer mesh, JS01583, into the front of the motor as seen in **Error! Reference source not found.**a. Insert all four pieces of exhaust mesh, HS03446, and secure with the exhaust plate, HS03442.



Figure 13a: Silencer Assembly



Figure 13b: Exhaust Mesh

#### D) MAINTENANCE PROCEDURE

Familiarise yourself with the Prowinch Hoist User Manual before conducting any maintenance.

The maintenance procedure for the air hoist motor, HS03450SM, follows a step by step procedure. The steps will refer to parts in the exploded view for the motor, therefore when conducting maintenance on the air hoist motor, do so with the drawing in hand.

Note: If during the course of the conducted maintenance, it is found that there is any significant wear or damage on a part replace the damaged or worn part

##### Step by Step Procedure:

1. Remove the motor from the hoist assembly by removing the cap screws, V405 & JS01458, that hold the motor to the centre housing
2. Remove the valve block, HS09400CP from the motor

3. Remove the brake cover, HS03468-3, by loosening the cap screws, V405
4. Remove the springs, JS03710, and the brake piston, HS03664-2, and check that the piston and spring are not rusted
  - a. Replace the brake piston O-Ring, HS09084
5. Remove the brake disc assembly, HS09063NC-CP, and check the thickness of the brake disc assembly
  - a. If the thickness is less than 1mm, replace assembly
6. Remove the silencer mesh, JS01583, and silencer baffle, JS01582, from the front of the motor and remove the end plates, cylinder, rotor and vanes with a rubber mallet
7. Once the internals have been removed, check the rear end plate assembly, HS03456MK2CP-W, for wear from the rotor
  - a. Any grooves worn into the face will require a replacement of the assembly
  - b. Replace o-rings, HS09084-1; HS01732, on the rear end plate assembly
  - c. Check that the bearing in this assembly is not notchy, if so replace the end plate assembly (Note the end plate spacer and assembly is a matched pair)
8. Remove the front end plate assembly, HS03396MK2CP-W
  - a. Look for wear on the face of the end plate
  - b. Check if the bearing is notchy
9. Remove the rotor, HS03555-NC
  - a. Check the vanes, HS03395W-1CAR, for any cracks or chips on the contacting face
  - b. Check that the vanes are not tight in the rotor slots
  - c. Replace the vane o-rings, HS09472
10. Clean and lubricate parts before rebuilding the motor
11. Rebuild the motor with the required new parts according to Section 3
12. Once the motor has been rebuilt, secure the valve block, gasket and control hoses
13. Connect the air supply to the valve block and drive the motor
  - a. Remove the silencer mesh and baffle before testing
  - b. Ensure that the rotor stops immediately after releasing the push button to make sure that the brake is engaging properly
  - c. Ensure that the motor runs smoothly in both directions

### c) GEARBOX WITH LOAD LIMITER ASSEMBLY INSTRUCTIONS

#### Introduction

This document serves to outline the way in which we at Prowinch assembles and disassembles the 1ton gearbox with load limiter. This is to standardise the way the gearbox is assembled.

#### Responsibility of the service engineer

When an engineer undertakes the examination or repair of a hoist, they are taking on a heavy responsibility. The future safety of people who operate the hoist will depend on their careful and deliberate workmanship.

For this reason, it is essential that only genuine Prowinch spare parts are used. Although it may be possible to fit components from other sources, it is impossible to be certain that they are built to the same high standard and are of comparable strength and durability.

This applies particularly to gearbox components. Apart from ensuring safe operation, the use of Prowinch spare parts also results in genuine long-term financial economical savings.

#### Assembly of the 1ton gearbox

This section will provide a step by step guide on how to assemble the Prowinch 1t Gearbox with Load Limiter, JS0134CP.

Step 1:

3rd stage crossbeam -combined sprocket gear assembly (JS01152-1)

Insert the shaft seal, JS01351, into the combined sprocket as seen in Figure 1 below.



Figure 1: Combined Sprocket with Shaft Seal

Clamp the combined sprocket, JS01152-1, onto a bench vice and insert the dowel pins, JS01315-3, into the sprocket holes as shown in Figure 2.

NB: Ensure that the chamfered side goes inside the hole.

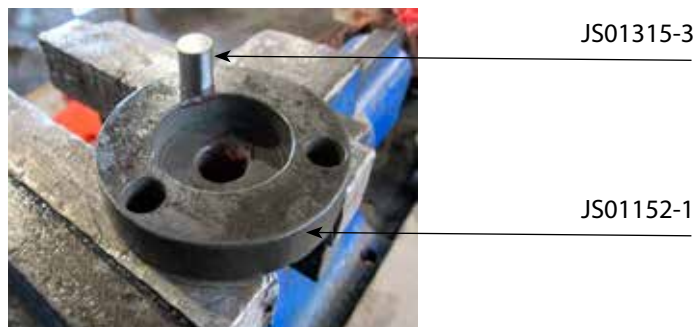


Figure 2: Dowel Pin Insertion



Hit with a hammer until the top level of the pins flush with the needle roller bearings, JS01007, (use a soft hammer to avoid damaging the pins). Refer to Figure 3.

NB: Lubricate the needle roller bearings with grease and insert onto the pin, if they do not level- up (flush), remove the bearing and hit the pin, until the pin and the needle roller bearing get to the same level of the gear. Ensure to place two needle bearings per pin (only for JS01152-1) then fit the inner bearing, JS01020, into the combined sprocket. Fit the 3rd stage gears, JS01313, onto the pins.



Figure 3: Crossbeam Gear Arrangement

#### Step 2:

2nd stage crossbeam gear assembly JS01311-5.

Clamp the crossbeam, JS01311-5, onto a bench vice

Follow the process in Step 1 using the following parts:

- 2nd Stage crossbeam JS01311-5
- Dowel pins JS01307D
- Same needle bearings JS01007
- Same inner bearing JS01020
- Gears JS01015

Only one needle bearing per pin

Complete assembly is shown in Figure 4.

Step 3:

1st stage crossbeam assembly JS01308-5.

Clamp the crossbeam, JS01308-5, onto a bench vice

Follow the process in Step 1 using the following parts:

- 1st Stage crossbeam JS01308-5
- Dowel pins JS01307D
- Same needle bearings JS01007
- Gears JS01006

Only one needle bearing per pin and no inner bearing

Complete assembly is shown in Figure 4



Figure 4 : Complete Set of Gears

Step 4:

O-rings

Fit 2 O-rings, HS09087, onto 2nd stage support washer, JS01344.

Apply grease. See Figure 5

Fit 1 O-ring, HS09087, into 1st stage support washer, JS01339

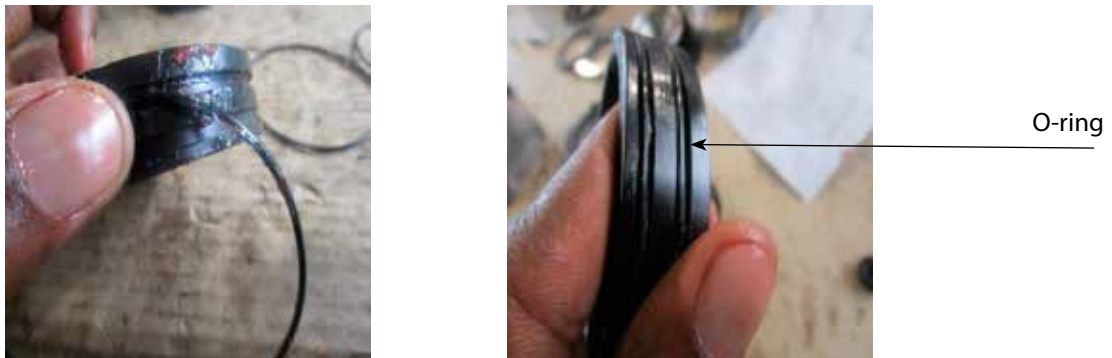


Figure 5: Greased O-Ring

Fit 1 O-ring, HS09087-1, into gearbox washer, JS01343-1T and apply grease. Fit the bearing, HS03424, into the gearbox washer, JS01343-1T as shown in Figure 6.



Figure 6: Gearbox Washer with Bearing

**Step 5:**

**Main assembly**

Clamp the 3rd stage crossbeam- combined sprocket assembly on a bench vice. (as completed in step 1), apply grease and place the 2nd stage support washer on top. Fit the 2nd stage cross beam assembly (completed in step 2) into the clamped 3rd stage assembly through the 2nd support washer, JS01344, and align the gears as shown in Figure 7.

Apply grease onto the inner surface of the housing, JS01345, and fit the housing. Align the gear teeth, the housing should slide down.



Figure 7: Housing Assembly

Fit the gear rim, JS01306, into the main housing assembly. See Figure 8.

Fit the 1st stage crossbeam assembly (as completed in step 3) onto the 1st stage support washer, JS01339, and insert into the main housing assembly. Align gears.

Insert the input shaft, JS01304-1. See Figure 8.

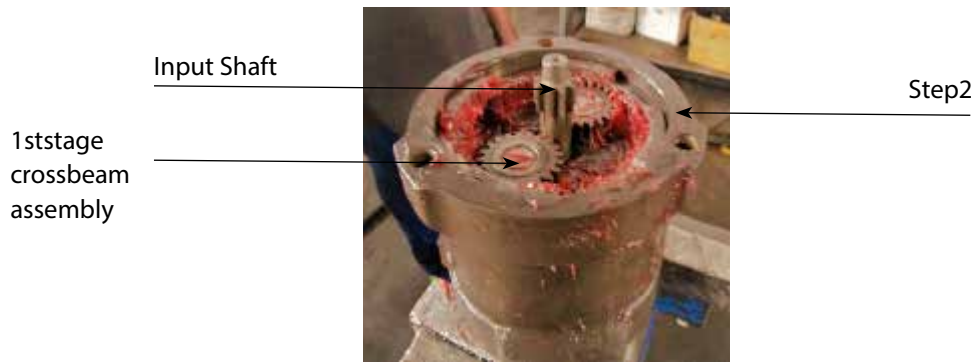


Figure 8

There is no timing on these gears

Fit the gearbox washer, JS01343-1T onto the input shaft. See Figure 9.



Figure 9

Step 6:

#### Load limiter Assembly

Fit the load limiter drive plate, JS09313-1, and align the teeth with those on the gear rim, JS01306. See Figure 10.

Fit the O-ring, TS20033, into the groove in the load limiter front housing, JS09331-1.



Figure 10: Load Limiter Assembly

Fit the front housing into the main assembly and Align holes. See Figure 11

Load Limiter Front Housing



Figure 11: Front Load Limiter Housing

Assemble the following parts:

- Fit the friction disc, JS09305.
- Fit the main plate, JS09312-1.
- Fit the second friction disc
- Fit pressure plate, JS09311-1.- Align holes
- Fit Belleville spring, JS01359.
- Fit Belleville washer pusher, HS09335.



Figure 12 :Various Brake Parts

Place the rear cover, JS09332-1, onto the assembled load limiter and correctly align holes

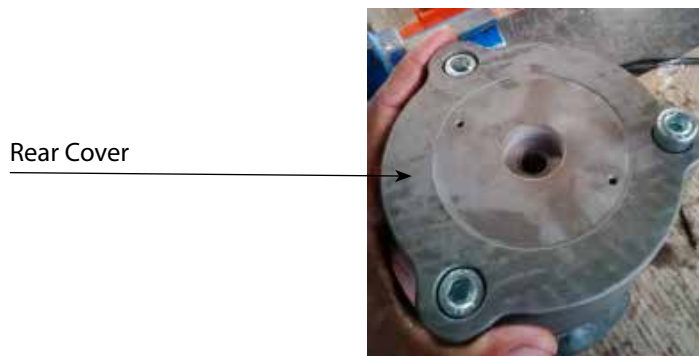


Figure 13

Screw the hex nut, HS09308CC-1, onto the load limiter set screw (JS09308) and screw into the rear cover. See Figure 13  
SET THE LOAD LIMITER as explained in section 5.

Fit the Prowinch name plate, HS09329T, and screw in with button head screws, HS09330T.



Figure 14: Complete Gearbox

## MAINTENANCE PROCEDURE

The maintenance procedure for the gearbox, JS01345CP, follows a step by step procedure. The steps will refer to the exploded view for the gearbox, therefore when conducting maintenance on the gearbox, do so with drawing in hand.

### Step by Step Procedure

1. Remove the gearbox from the hoist assembly by removing the cap screws
2. Remove the cap screws, JS03436A and remove the rear cover, JS09332-1.
3. Check and replace the load limiter friction discs, JS09305, and if thickness is less than 2.8mm
4. Replace O-Ring TS20033.
5. Remove the load limiter drive plate, JS09313-, and replace O-ring, HS09087-1, inserted on the gearbox washer JS01343-1T.
6. Clamp the sprocket on a bench vice and knock out the housing, JS01345, with a rubber mallet
7. Remove the input shaft, JS01304-1, and check the needle bearings, JS01007 for any significant damage. This could be done by rotating the gears. If the rotation is not smooth, Replace the bearing. Do this for all needle bearings.
8. Remove the gear rim, JS01306, and Check Bearings, HS03424 and JS01020 for any signification damage or notchy rotation. Replace if necessary
9. Replace all 3 HS09087, O-Rings
10. Check for wear and damage on all gear teeth. If any gear teeth are damaged that gear in particular part should be replaced.
11. Clean and re-grease the gearbox housing
12. Rebuild the gearbox with the required new parts according to Section 3.

## GEARBOX LOAD LIMITER SETTING

These are the steps that one needs to follow to set the load limiter for the 1t Gearbox.

1. Connect a load of 130% of the working load
2. Tighten the load limiter grub screw
3. Lift the load
  - a. If the load lifts loosen the grub screw
  - b. If the load doesn't lift tighten the grub screw
4. Adjust the grub screw until the load can lift 10cm off the ground and no further
5. Note that the load limiter is a sensitive device and may only require slight adjustments
6. Be careful to not let the load limiter over heat when setting. If the load limiter over heats, wait until it cools down and then adjust
7. Once the load limiter has been set, reduce the load to 100% of the working load and lift the load
8. If there is any sign of the load slipping repeat steps 1 to 7

#### d) ASSEMBLY AND MAINTENANCE OF 1T HOIST

This section will give instructions on what to look for when conducting maintenance on the 1t PWRN/PWRCN Hoist, PWRN/PWRCN-01-PC. The maintenance will be done in step by step format, while referring the numbered parts in Figure 1.

Familiarise yourself with the Prowinch Hoist User Manual before conducting any maintenance.

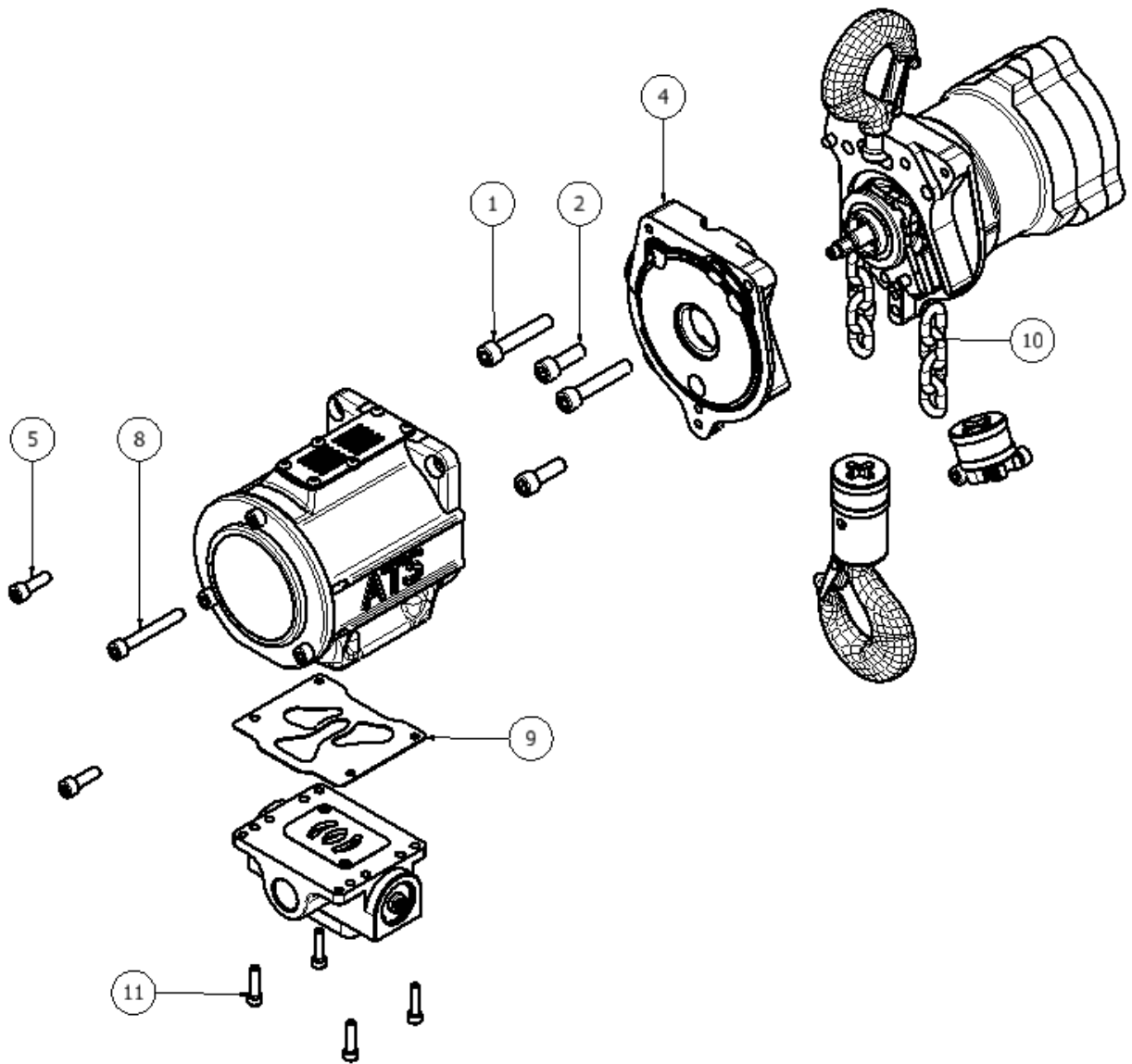


Figure 1: 1t PWRN/PWRCN Hoist Assembly





Step by Step Procedure:

1. Remove the cap screws, 11, from the assembly and remove the valve block
2. Check gasket, 9, for any damage and replace if necessary
3. Remove cap screws 5 & 8 from the assembly
  - a. Remove motor and conduct motor maintenance
4. Remove cap screws 1 & 2 and remove the centre housing 4
5. Remove the chain 10 by rotating the input shaft and conduct chain maintenance as stated in the Prowinch hoist user manual
  - a. Use the same procedure to reinsert the chain
  - b. Take note of the position of the chain weld when reinserting the chain. The weld must face away from the sprocket
  - c. Do not reinsert the chain by driving the hoist
6. Conduct maintenance on the gearbox and centre housing assemblies as per their individual maintenance documents

### e) MAINTENANCE OF THE CENTRE HOUSING

This section will give instructions on what to look for when conducting maintenance on the 1t PWRN/PWRCN Centre Housing. The maintenance will be done in step by step format, while referring to the numbered parts in Figure 1. Familiarise yourself with the Prowinch Hoist User Manual before conducting any maintenance.

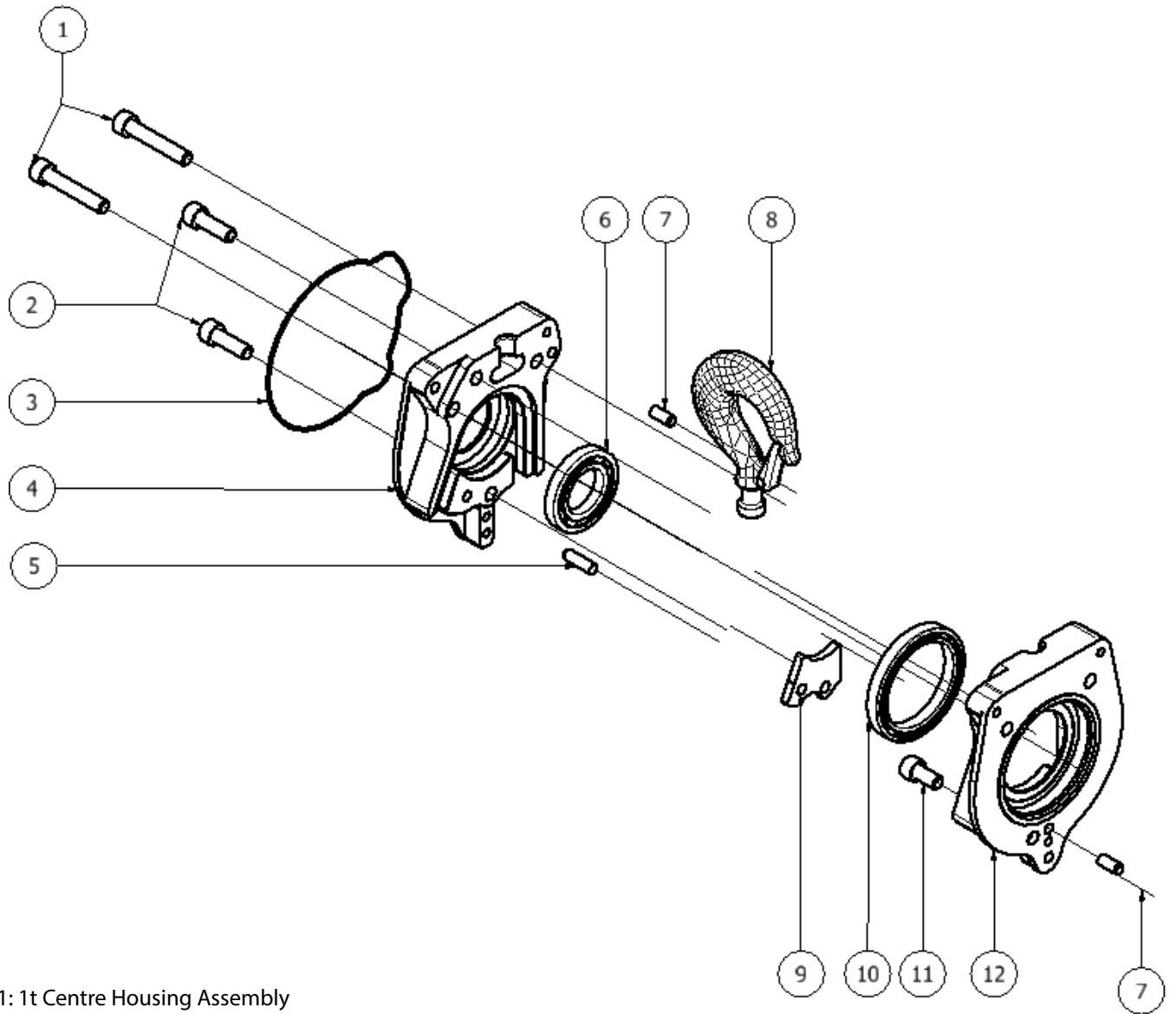


Figure 1: 1t Centre Housing Assembly

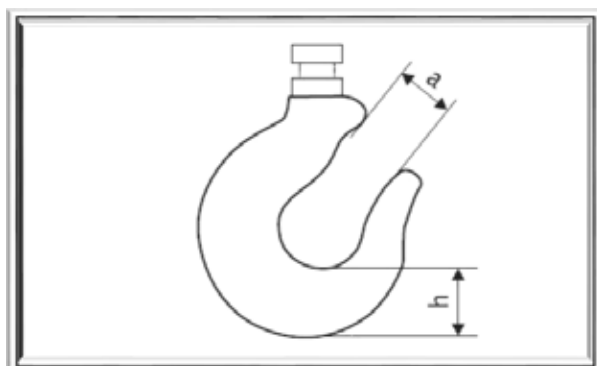


Step by Step Procedure:

1. Remove the cap screws, 1 & 2, from the assembly
2. Check that bearings 6 & 10 are not notchy or damaged
3. Check that the centre housings, part 4 & 12, have no damage
  - a. Significant wear on the chain guides
  - b. Deformed hook seat
4. Check the chain stripper, 9, for any damage e.g. gouging or deformation
5. Check that the hook, 8, has no deformation on the hook shoulder and that the safety catch is still functioning correctly
6. Replace o-ring 3 and align it with the o-ring groove profile in the face of part 4, before fitting the motor
7. Any damaged or broken cap screws and pins must be replaced with genuine Prowinch parts

## 17. RECORDS AND REPORTS

An inspection record should 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.



### Periodic Inspection

Frequency of periodic inspection depends on the severity of usage:

**NORMAL**  
Yearly

**HEAVY S**  
Biannually

**SEVERE**  
Quarterly



- **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:

#### 17.1. Fasteners.

Check cap screws and nuts. Replace if missing or tighten if loose.

#### 17.2. 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.

**17. 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.

**17. 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.

**17. 5. 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.

**17. 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. Remove brake disc as described in the "MAINTENANCE" section. Check and clean the brake parts each time the hoist is dismantled. Replace the brake disc if the thickness is less than 5 mm.

**17. 7. Supporting Structure.**

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

**17. 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 4.5 to 6 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.

**17. 9. Nameplate.**

Check for presence and legibility. Replace if necessary.

**17. 10. Load Chain and Anchors.**

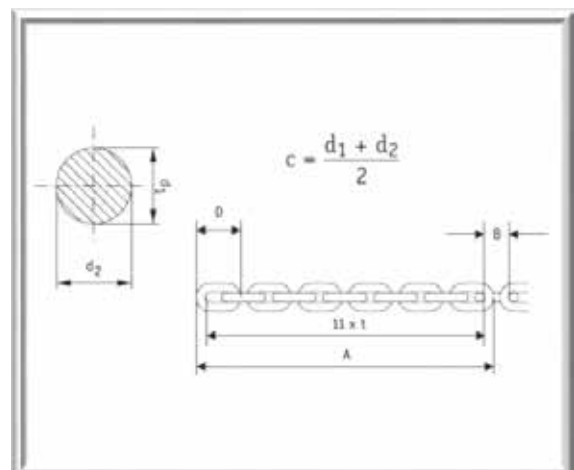
Ensure both ends of the load chain are securely attached to the hook swivel or chain stopper. Secure if loose, repair if damaged, replace if missing.

**17. 11. Load Chain.**

Measure the load chain for wear and stretching as shown below and compare to the allowable limits in Table 3. 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. Always use the load chain recommended by Prowinch for the desired application.

| Chain d x t        | 7x21  | 9x27  | 11.2x34 | 13x36 | 16x45 |
|--------------------|-------|-------|---------|-------|-------|
| Dimension A max.   | 249.2 | 320.5 |         | 429.2 | 536   |
| 11 x t inside max  | 235.8 | 303.2 |         | 404.3 | 505.3 |
| 5 link inside max. |       |       | 107.8   |       |       |
| Dimension B max.   | 22.1  | 28.4  | 35.8    | 37.9  | 47.4  |
| Dimension C max.   | 6.3   | 8.1   | 10.1    | 11.7  | 14.4  |
| Dimension D max.   | 36.1  | 46.4  | 57.8    | 63.6  | 79.3  |

Dimension in mm



### **17. 12. Chain Bag / Container.**

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

### **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.

### **Filtration**

Should the airline filtration not be integrated into the motor housing a proper high capacity filter is required with a 100 micron screening and should were 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.

Testing the Brake (Motorised Trolleys)

Test the brake function daily.

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

### **ATTENTION!**

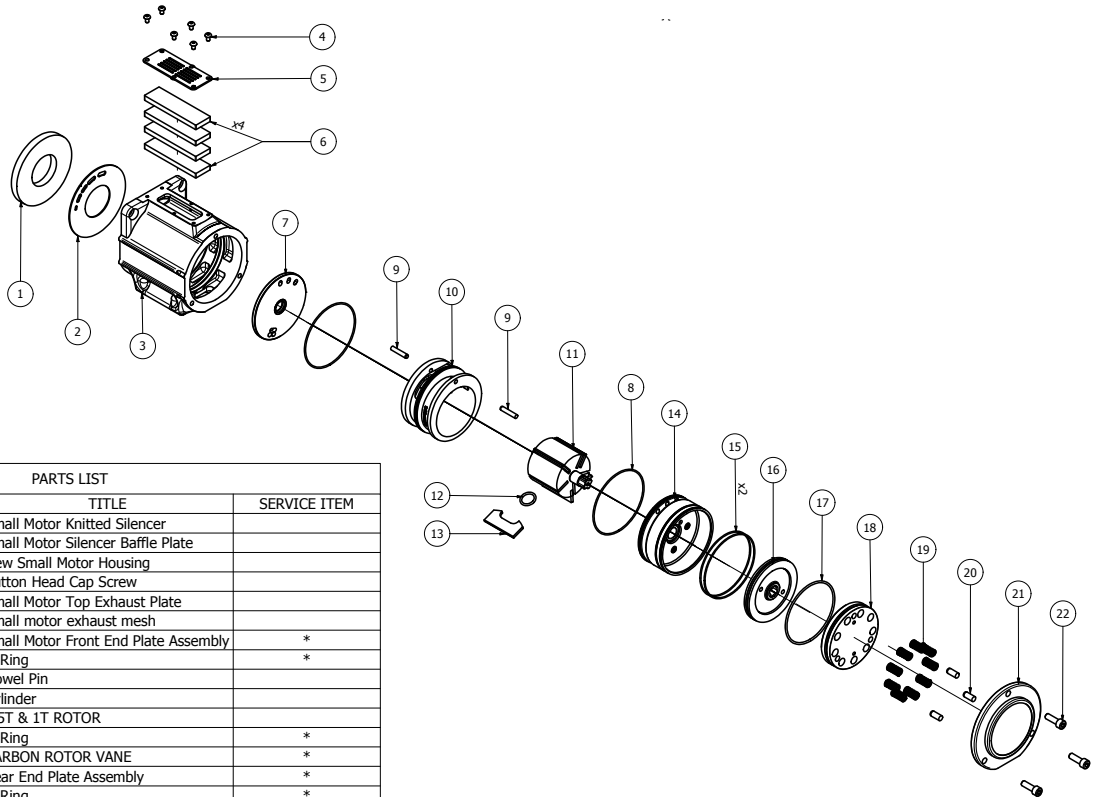
If the trolley keeps running for an unusually long time after braking, the brake has to be repaired.

## **18. TROUBLESHOOTING**

This section provides the information necessary for troubleshooting the Prowinch PWRN/PWRCN series of hoists. The troubleshooting guide provides a general outline of problems which could be experienced with normal use of the hoist. It lists the symptom, the possible cause, and the possible remedy for the trouble being experienced.


| <b>SYMPTOM</b>   | <b>CAUSE</b>  | <b>REMEDY</b>  |
|--|---|--|
| 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  |

## 19. PARTS LIST - MOTOR



| PARTS LIST |     |                |                                      |              |
|------------|-----|----------------|--------------------------------------|--------------|
| ITEM       | QTY | STOCK NUMBER   | TITLE                                | SERVICE ITEM |
| 1          | 1   | JS01583        | Small Motor Knitted Silencer         |              |
| 2          | 1   | JS01582        | Small Motor Silencer Baffle Plate    |              |
| 3          | 1   | HS03451W       | New Small Motor Housing              |              |
| 4          | 6   | HS03496-1      | Button Head Cap Screw                |              |
| 5          | 1   | HS03442        | Small Motor Top Exhaust Plate        |              |
| 6          | 4   | HS03446        | Small motor exhaust mesh             |              |
| 7          | 1   | HS03396MK2CP-W | Small Motor Front End Plate Assembly | *            |
| 8          | 2   | HS01732        | O-Ring                               | *            |
| 9          | 2   | HS03447        | Dowel Pin                            |              |
| 10         | 1   | HS03544MK2-W   | Cylinder                             |              |
| 11         | 1   | HS03555-NC     | 0.5T & 1T ROTOR                      |              |
| 12         | 5   | HS09472        | O-Ring                               | *            |
| 13         | 5   | HS03395W-1CAR  | CARBON ROTOR VANE                    | *            |
| 14         | 1   | HS03456MK2CP-W | Rear End Plate Assembly              | *            |
| 15         | 2   | HS09084-1      | O-Ring                               | *            |
| 16         | 1   | HS09063NC-CP   | NC Brake Disk Assembly               | *            |
| 17         | 1   | HS09084        | O-Ring                               | *            |
| 18         | 1   | HS03664-2      | Brake Piston                         |              |
| 19         | 9   | JS03710        | Brake Spring                         | *            |
| 20         | 3   | RS0015         | Dowel Pin                            |              |
| 21         | 1   | HS03468-3      | Brake Rear Cover                     |              |
| 22         | 3   | V405           | Cap Screw                            |              |

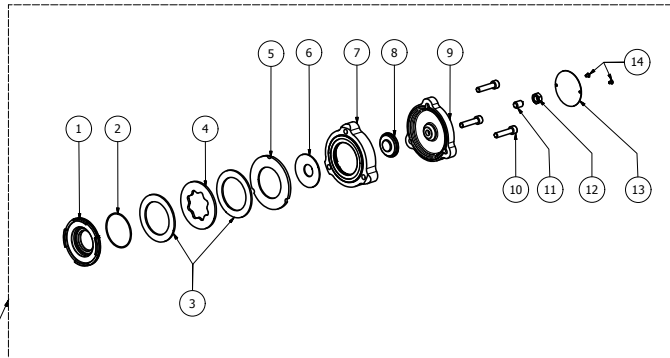
Parts marked as service items should be kept in stock and replaced when the motor is serviced

|   |                 |
|---|-----------------|
|  | 0.5T & 1T MOTOR |
|   | MOTOR 0.5T & 1T |
| PWRCN015EP  |                 |



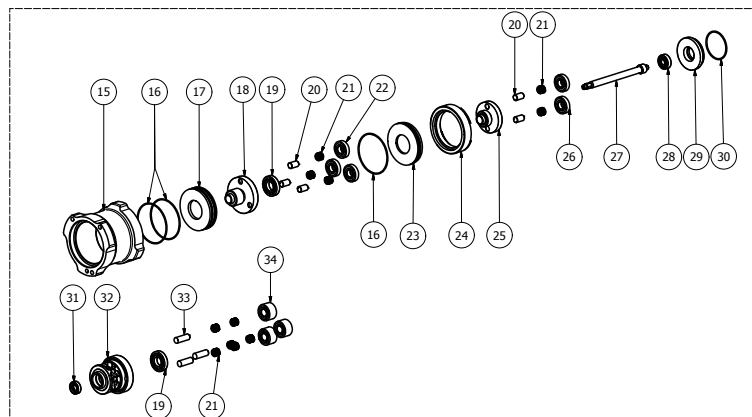
# - GEARBOX

| Parts List- Load Limiter JS09336CP |     |              |                             |              |
|------------------------------------|-----|--------------|-----------------------------|--------------|
| ITEM                               | QTY | STOCK NUMBER | TITLE                       | SERVICE ITEM |
| 1                                  | 1   | JS09313-1    | Load Limiter Drive Plate    |              |
| 2                                  | 1   | TS20033      | O-Ring                      | *            |
| 3                                  | 2   | JS09305      | Load Limiter Friction Disc  |              |
| 4                                  | 1   | JS09312-1    | Load Limiter Main Plate     |              |
| 5                                  | 1   | JS09311-1    | Load Limiter Pressure Plate |              |
| 6                                  | 1   | JS01359      | Belleville Spring           |              |
| 7                                  | 1   | JS09331-1    | Load Limiter Front Housing  |              |
| 8                                  | 1   | HS09335      | Belleville Washer Pusher    |              |
| 9                                  | 1   | JS09332-1    | Load Limiter Rear Cover     |              |
| 10                                 | 3   | JS03436A     | Cap Screw                   |              |
| 11                                 | 1   | JS09308      | 2t Load Limiter Set Screw   |              |
| 12                                 | 1   | HS09308C     | Hex Nut                     |              |
|                                    |     |              | C-1                         |              |
| 13                                 | 1   | HS09329T     | Nameplate Disc              |              |
| 14                                 | 2   | HS09330T     | Button Head Cap Screw       |              |



Load Limiter JS09033CP

| Parts List- Gearbox |     |              |  |              |
|---------------------|-----|--------------|--|--------------|
| ITEM                | QTY | STOCK NUMBER | TITLE  | SERVICE ITEM |
| 15                  | 1   | JS01345      | Gearbox Housing                                  |              |
| 16                  | 3   | HS09087      | O-Ring   |              |
| 17                  | 1   | JS01344      | 2nd Stage Crossbeam Support Washer               | *            |
| 18                  | 1   | JS01311-5    | 2nd Stage Crossbeam                              |              |
| 19                  | 2   | JS01020      | Deep Groove Ball Bearing                         |              |
| 20                  | 5   | JS01307D     | Cut Dowel Pin                                    | *            |
| 21                  | 11  | JS01007      | Needle Roller Bearing                            |              |
| 22                  | 3   | JS01015      | 2nd Stage Planetary Gear                         |              |
| 23                  | 1   | JS01339      | 1st Stage Crossbeam Support Washer               | *            |
| 24                  | 1   | JS01306      | 1st Stage Gear Rim                               |              |
| 25                  | 1   | JS01308-5    | 1st Stage Crossbeam                              |              |
| 26                  | 2   | JS01006      | 1st Stage Planetary Gear                         |              |
| 27                  | 1   | JS01304-1    | 1t Gearbox Input Shaft                           |              |
| 28                  | 1   | HS03424      | Deep Groove Ball Bearing                         |              |
| 29                  | 1   | JS01343-1    | GEARBOX WASHER                                   | *            |
|                     |     |              | T  |              |
| 30                  | 1   | HS09087-1    | O-Ring   |              |
| 31                  | 1   | JS01351      | Shaft Seal                                       |              |
| 32                  | 1   | JS01152-1    | 7x21mm Combined Sprocket developed off RUD model |              |
| 33                  | 3   | JS01315-3    | Dowel Pin  | *            |
|                     |     |              | 6  |              |
| 34                  | 3   | JS01313      | 3rd Stage Planetary Gear                         |              |

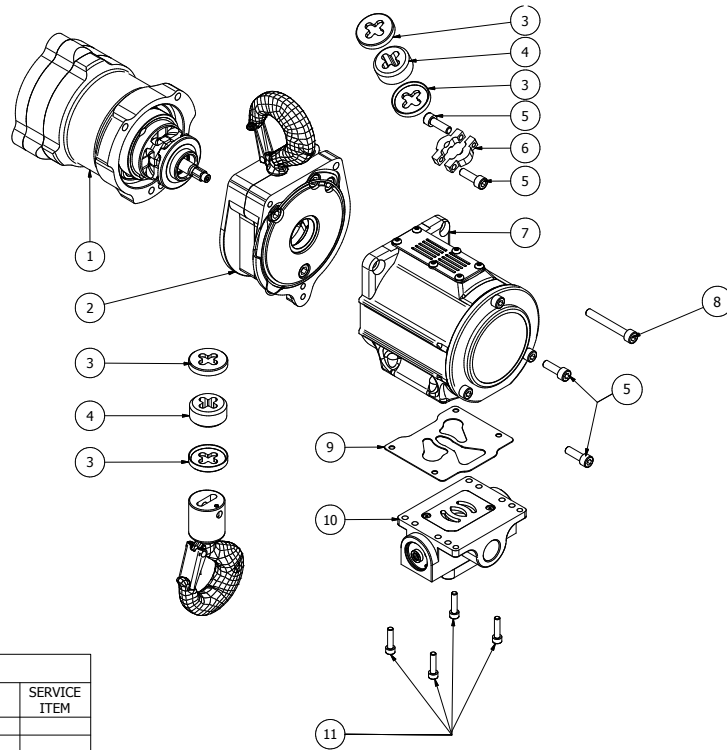


Gearbox

Parts marked as service items\* should be kept in stock and replaced when the gearbox is serviced

|            |   |
|------------|---|
|            | 1-1,5T GEARBOX WITH LOAD LIMITER              |
|            | CAJA DE CAMBIOS CON LIMITADOR DE CARGA 1-1,5T |
| PWRCN015EP |   |

## - PWRN/PWRCN CENTRE HOUSING ASSEMBLY



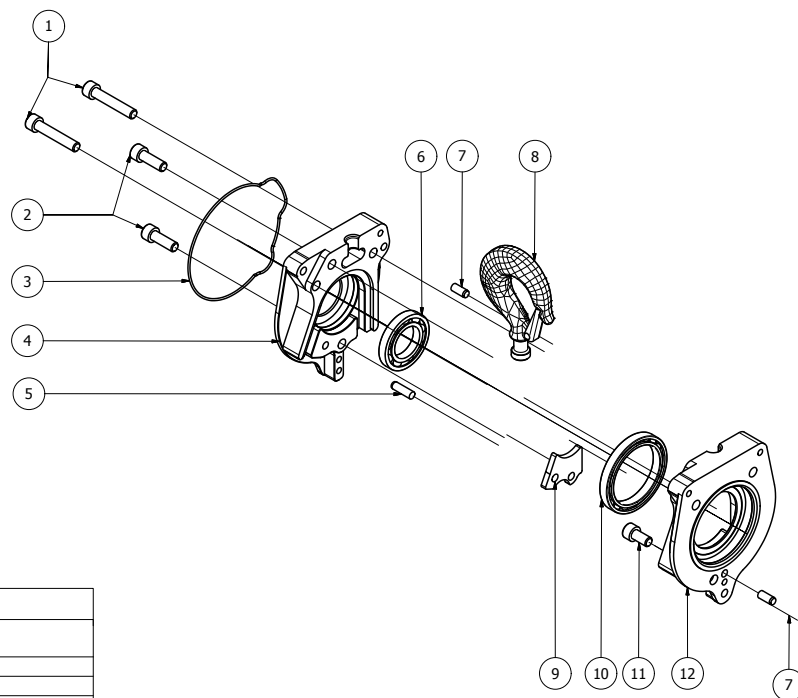
PARTS LIST

| ITEM | QTY | STOCK NUMBER | TITLE                      | SERVICE ITEM |
|------|-----|--------------|----------------------------|--------------|
| 1    | 1   | JS01345CP    | Gearbox with Load Limiter  |              |
| 2    | 1   | JS01361CP    | Centre Housing Assembly    |              |
| 3    | 4   | JS01202      | 7MM BUFFER STEEL PLATE     |              |
| 4    | 2   | JS01203      | 7MM BUFFER                 |              |
| 5    | 4   | V405         | Cap Screw                  |              |
| 6    | 2   | JS01369      | 7mm CHAIN DEAD END         |              |
| 7    | 1   | HS03450SMC   | 0,5T & 1 T MOTOR           |              |
| 8    | 1   | JS01458      | Cap Screw                  |              |
| 9    | 1   | HS09420-1    | SMALL MOTOR PENDANT GASKET | *            |
| 10   | 1   | HS09400CP    | PILOT CONTROL VALVE        |              |
| 11   | 4   | HS09191      | Cap Screw                  |              |


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PWRCN015EP

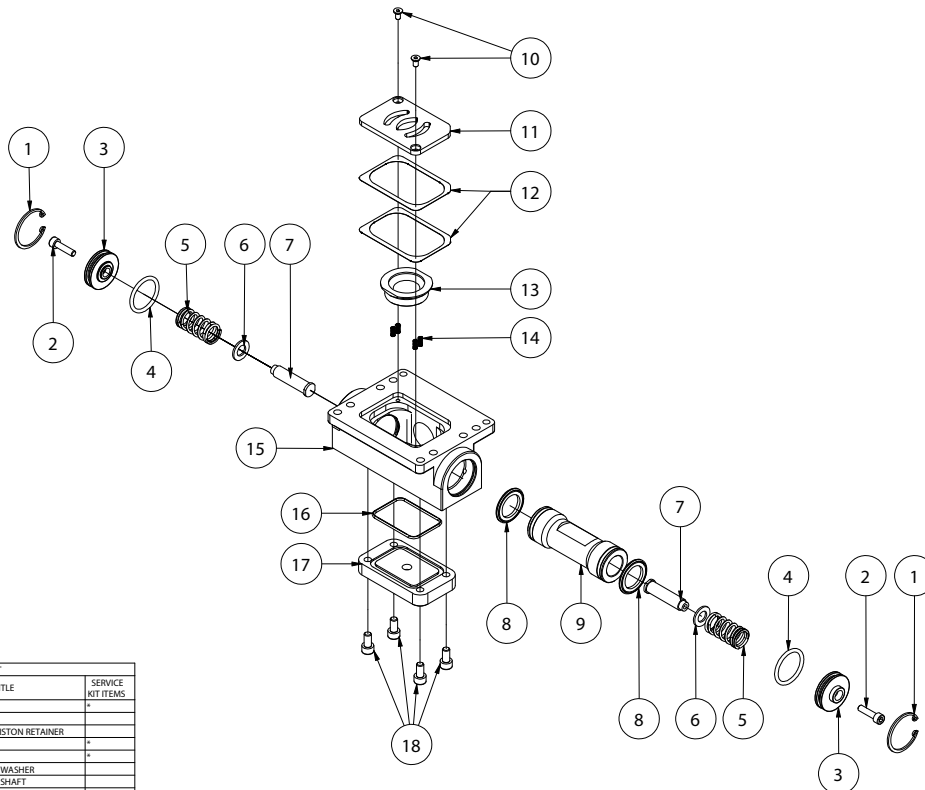
## - CENTRE HOUSING ASSEMBLY




| PARTS LIST |     |              |                             |
|------------|-----|--------------|-----------------------------|
| ITEM       | QTY | STOCK NUMBER | TITLE                       |
| 1          | 2   | JS14052-1    | Cap Screw                   |
| 2          | 2   | CS530        | Cap Screw                   |
| 3          | 1   | JS01448      | O-Ring                      |
| 4          | 1   | JS01361      | CENTRE HOUSING MOTOR SIDE   |
| 5          | 1   | JS01207      | Dowel Pin                   |
| 6          | 1   | JS01023      | Deep Groove Ball Bearing    |
| 7          | 2   | RS0015       | Dowel Pin                   |
| 8          | 1   | JS01360      | Top Hook                    |
| 9          | 1   | JS01545      | CHAIN STRIPPER              |
| 10         | 1   | JS01642      | Deep Groove Ball Bearing    |
| 11         | 1   | RS0121       | Cap Screw                   |
| 12         | 1   | JS01361-1    | CENTRE HOUSING GEARBOX SIDE |

|   |                                 |
|---|---------------------------------|
|  | 1-1,5T CENTRE HOUSING ASSEMBLY  |
|   | CONJUNTO ENSAMBLE CENTRO 1-1,5T |
| PWRCN015EP  |                                 |

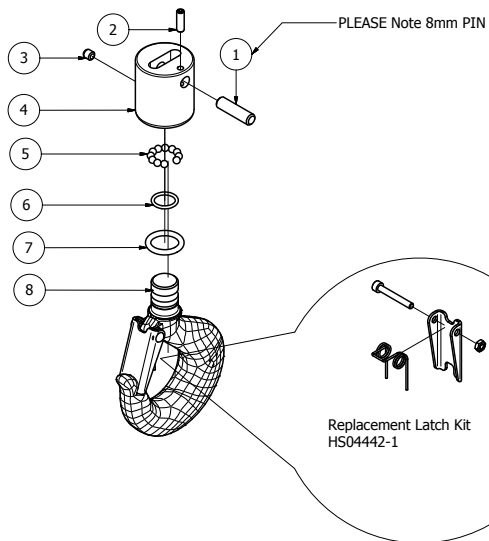
## - PILOT CONTROL VALVE



| PARTS LIST |     |              |                               |                   |
|------------|-----|--------------|-------------------------------|-------------------|
| ITEM       | QTY | STOCK NUMBER | TITLE                         | SERVICE KIT ITEMS |
| 1          | 2   | HS09409      | Internal Circlip              | *                 |
| 2          | 2   | HS09408-1    | Cap Screw                     | *                 |
| 3          | 2   | HS09404      | PILOT PENDANT PISTON RETAINER |                   |
| 4          | 2   | HS09412      | O-Ring                        | *                 |
| 5          | 2   | HS09406      | PISTON SPRING                 | *                 |
| 6          | 2   | HS09407      | SPRING RETAINER WASHER        | *                 |
| 7          | 2   | HS09405      | SPRING RETAINER SHAFT         | *                 |
| 8          | 2   | HS09411      | AIRZET SEAL                   | *                 |
| 9          | 1   | HS09401      | PILOT VALVE MAIN SHAFT        |                   |
| 10         | 2   | HS09499      | Countersunk Cap Screw         | *                 |
| 11         | 1   | HS09403      | SHUTTLE VALVE PLATE           |                   |
| 12         | 2   | HS09415-1    | Pilot Valve Adhesive Gasket   | *                 |
| 13         | 1   | HS09402      | SHUTTLE VALVE                 |                   |
| 14         | 4   | HS09421      | SHUTTLE VALVE SPRING          | *                 |
| 15         | 1   | HS09400      | PILOT VALVE BLOCK             |                   |
| 16         | 1   | HS09416      | O-Ring                        | *                 |
| 17         | 1   | HS09415      | Pilot Valve Base Plate        |                   |
| 18         | 4   | CS513-C      | Cap Screw                     |                   |

|   |  |  |
|---|--|--|
|  | PILOT CONTROL VALVE<br>VALVULA DE CONTROL PILOTO |  |
|   | PWRCN015EP                                       |  |

## - HOOK ASSEMBLY



| PARTS LIST |     |                                   |              |
|------------|-----|-----------------------------------|--------------|
| ITEM       | QTY | TITLE                             | STOCK NUMBER |
| 1          | 1   | Dowel Pin                         | JS01323      |
| 2          | 1   | Grub Screw                        | HS09377-3    |
| 3          | 1   | Grub Screw                        | HS09466-1    |
| 4          | 1   | COMPACT SWIVEL HOOK COLLAR        | JS01831      |
| 5          | 12  | 5mm balls for hook                | HS01027      |
| 6          | 1   | O-Ring                            | V464         |
| 7          | 1   | O-Ring                            | JS01209      |
| 8          | 1   | Complete Bearing Type Bottom Hook | JS04442      |

|   |                          |  |
|---|--------------------------|--|
|  | 1-1,5T HOOK ASSEMBLY     |  |
|   | Montaje de Gancho 1-1,5T |  |
| PWRCN015EP  |                          |  |

## **20. LIMITED WARRANTY COVERAGE**

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.

### **DISCLAIMER**

In no event shall PROWINCH be liable for any labor, removal and installation expenses, loss of time, manufacturing costs, transportation, materials, loss of profits, incidental, special, consequential or punitive damages, or for any costs, attorney fees, expenses, losses or delays, direct or indirect, alleged to be as a consequence of any damage to, failure of, or defect in any product including, but not limited to, any claims for loss of profits. PROWINCH disclaims any implied warranties, including without limitation, any implied warranty of merchantability or fitness for a particular use or purpose.

Acceptance of the exclusive repair and replacement remedies described herein is a condition of the contract for the purchase of every PROWINCH product. If you do not agree to this condition, you should not purchase the product.



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