



SS11/PROLH

Tiger Subsea Lever Hoist &
Tiger Professional Lever
Hoist



ORIGINAL INSTRUCTION GUIDE

- PLEASE PASS ONTO OPERATOR

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Manual Tiger SS11-PLH En 201704 v3.2





Operator Instruction Guide



MUST READ BEFORE USE

1. It is important that this manual is read and fully understood and that all instructions are followed before using the lever hoist.
2. Inspect the machine, chain and accessories for any damage or wear before use. Do not use the machine if it is not in good working order.
3. When a "DO NOT OPERATE" sign is placed on the hoist, do not operate the hoist until the sign has been removed by designated personnel.
4. The lever hoist must be operated, inspected, maintained and repaired by a competently trained person in accordance with applicable safety codes and regulations.
5. Do not use the machine to lift, support or transport people in any way.
6. Do not hoist loads over or near people.
7. Never work under or near hoisted loads.
8. The machine is for manual operation only. Do not attempt to use a motorized mechanical device to operate the machine.
9. Do not attempt to overload the machine as this could cause damage to person or machine.
10. Do not use the lever hoist in explosive environments unless an ATEX version has been supplied.
11. It is the responsibility of the operator to exercise caution, use good practice, common sense and be familiar with proper rigging techniques.
12. Improper lever hoist use could result in death or serious injury.
13. The supplier takes no responsibility for any form of consequential loss or damage as the result of unauthorised repair or use of spare part other than those issued on behalf of the manufacturer/supplier.
14. If an SS11 unit is to be used in multi-immersion applications then the separate instructions for multi-immersion use must also be followed.

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For details of the full Tiger product range visit our website: www.tigerlifting.com

Due to our policy of continual product development, dimensions, weights and specifications may change without prior notice.

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1. Safety Information

Tiger Lifting products have been built in accordance with state of the art and generally accepted engineering standards. Nonetheless, incorrect handling when using the products may cause dangers to life and limb of the user or third parties and/or damage to the hoist or other property. The operating company is responsible for the proper and professional instruction of the operating personnel. The personnel responsible for operation, maintenance or repair of the product must read, understand and follow these operating instructions. These instructions are intended to make the user familiar with the product and enable them to use it to the full extent of its intended capabilities. This manual contains important Information to help you properly install, operate and maintain your lever hoist for maximum performance, economy and safety. Acting in accordance with these instructions helps to avoid danger, reduces repair costs and downtime and increases the reliability and lifetime of the product.

The operating instructions must always be available at the place where the product is operated. Apart from the operating instructions and the accident prevention act valid for the respective country and area where the product is used, statutory regulations and procedures along with the commonly accepted regulations for safe and professional work must also be adhered to. The indicated protective measures will only provide the necessary safety if the product is operated correctly and installed and/or maintained according to the instructions. The operating company must be committed to ensure safe and trouble-free operation of the product.

If the product's ability to do a job, or to do so safely is in question - DON'T TRY IT.

Definitions

! WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It may also be used to alert against unsafe practices.

Competent person

The competent person should have appropriate, practical and theoretical knowledge and experience of the Tiger product which will enable them to detect defects or weaknesses and to assess their importance in relation to the safety and continued use of the unit. Competent persons may be, for example, the maintenance engineers of the manufacturer or the supplier. However, the company may also assign performance of the inspection to its own appropriately trained specialist personnel.


Health and Safety at Work

All lifting equipment must be maintained and tested to meet relevant statutory regulations (e.g. PUWER/LOLER) when put to use. It is the responsibility of every company to ensure that their employees have been fully and properly trained in the safe operation of their equipment.

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, federal, state and local regulations are checked. Read all operating instructions and warnings before operation.

Equipment Labelling

The identification label/name plate details the product type, model, manufacturer, working load limit (WLL), position markers for up, down and neutral, serial number and the grade and size of the load chain. The CE marking indicates compliance with the essential health and safety requirements of the Machinery Directive 2006/42/EC. Other international standards that the unit conforms to may be shown.

ATEX models will be marked with the  logo.



An example of the SS11 label.
Labels on earlier models may be different.

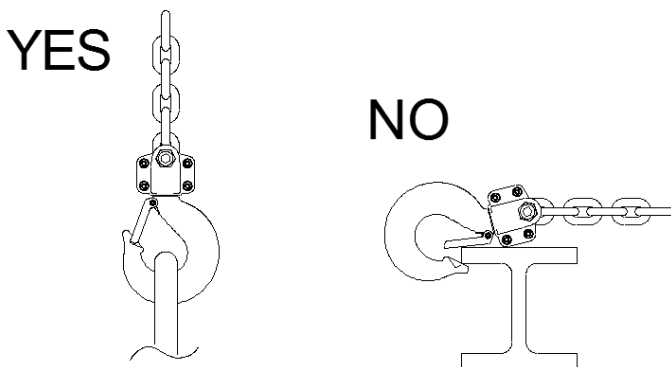


Safety Instructions

! WARNING

Improper use of lever hoists could result in death or serious injury, to avoid these hazards:

- Always** be familiar with lever hoist operating controls, procedures and warnings.
- Always** allow only competently trained people to operate the hoist.
- Always** operate a hoist only if you are physically fit.
- Always** inspect the hoist before use (Refer to Chapter 5).
- Always** let the authorised personnel inspect the hoist periodically (Refer to Chapter 5).
- Always** make sure the lever hoist suspension hook is securely attached to a suitable support. The selection and calculation of the appropriate supporting structure are the responsibility of the operating company.
- Always** maintain a firm footing or be otherwise secured when operating the lever hoist.
- Always** make sure that load slings or other approved sling attachments are properly sized and seated in the hook saddle. Only approved and certified lifting tackle must be used.
- Always** make sure that the hook latch, is closed and not supporting any part of the load.



- Always** make sure that the load is free to move and will clear all obstructions.
- Always** take up slack chain carefully, check load balance, then lift a few centimetres and check to be sure the brake will hold the load and that attachments to the load are firmly seated.
- Always** avoid any swinging of the load or load hook.
- Always** protect load chain from weld spatter or other damaging contaminants.
- Always** report any malfunction, unusual performance or damage of lifting equipment promptly to the appropriate person.
- Always** inspect the lever hoist regularly, replace damaged or worn parts and keep appropriate records of maintenance.
- Always** use genuine Tiger parts when repairing the lever hoist.
- Always** apply lubricant to the load chain as recommended in this manual.
- Always** make sure that you and others are clear of the load before lifting begins and stay clear of the suspended load.
- Always** warn personnel of your intention to move a load in their area. The operator may start moving the load only after it has been attached correctly and all persons are clear of the danger zone.
- Always** make sure that the chain length is long enough for the intended job.
- Always** check that the hook latches are in proper working order before use (Refer to Chapter 6). Replace missing, damaged or broken hook latches.
- Always** be sure that the hoist's rated capacity, which is found on the hoist's name plate/label and forged into the hooks, is in excess of the weight of the load.
- Always** keep the load from hitting the chain.
- Always** use two hoists which have rated capacities equal to or more than the load to be lifted whenever you must use two hoists to lift a load. This will provide adequate protection in the event that a sudden load shift or failure of one hoist occurs.

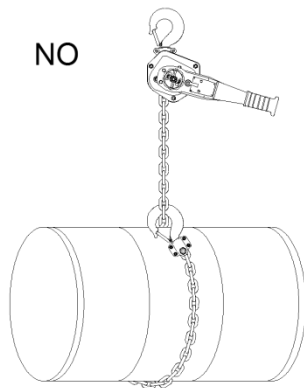


- Always** check the brake before use (Refer to Chapter 5).
- Always** check for loose or missing parts before use.
- Always** lubricate the hoist regularly (Refer to Chapter 7).
- Always** pay attention to the load at all times when operating the hoist.
- Always** secure a hoist and loads properly after use.
- Always** consult the manufacturer or your dealer if you plan to use a hoist in an excessively corrosive environment.
- Always** operate the hoist with manual power.
- Always** stop using the hoist immediately in case of functional defects or abnormal operating noise.
- Always** observe that the chain hangs straight (without twists) from lever hoist to lower hook.
- Always** pull or lift in a straight line from hook to hook.
- Always** make sure the lever hoist is free to swivel on the upper hook.
- Always** fit load chains which have been approved by the manufacturer.
- Always** position the end stop if the load or tension is to be left in place.

! WARNING

Improper use of lever hoists could result in death or serious injury, to avoid these hazards:

- Never** attempt to lift more than the rated load capacity (WLL) of the suspension and the supporting structure.
- Never** allow your attention to be diverted from operating the lever hoist.
- Never** attempt to operate this equipment under the influence of alcohol or drugs.
- Never** wrap the load chain around the load and hook onto itself as a sling/choker chain.

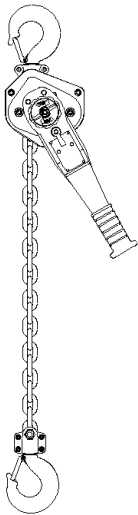


- Never** wrap loose chain into a hook bowl.
- Never** insert the point of the hook into a chain link.
- Never** lift a load if binding prevents equal loading on the load chain.
- Never** let the load swing or come into contact with other objects.
- Never** use the lever hoist to lift, lower, support or transport people.
- Never** lift a load over people.
- Never** work near or under hoisted loads.
- Never** use a damaged lever hoist or a lever hoist that is not working correctly.
- Never** use a lever hoist which has been taken out of service until it has been properly repaired or replaced.
- Never** use a hoist if the hook latch is missing or broken (if one is intended to be fitted).
- Never** splice load chain by using pins, bolts, screw drivers or similar between links.
- Never** attempt to lengthen the load chain or repair damaged load chain.
- Never** force a hook or chain into place by hammering.
- Never** use the lever hoist with twisted, kinked, damaged, stretched or worn chain.
- Never** swing a suspended load.

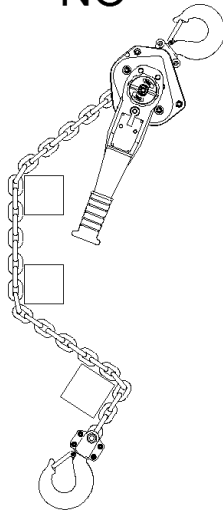


- Never** support a load on the tip of the hook.
- Never** suspend a load for an extended period of time.
- Never** run the load chain over a sharp edge; use a sheave.

YES



NO



- Never** weld or cut a load suspended by a hoist.
- Never** use the hoist chain as a welding electrode or allow the chain or hook to be touched by a live welding electrode.
- Never** allow the chain or hook to be used as an earth for welding.
- Never** use the hoist with rusty chain.
- Never** run the lower hook block into the lever hoist frame or bring the load in contact with the lever hoist. Case and/or chain guide damage may result.
- Never** operate the lever hoist beyond limits of load chain travel or run the hook assembly into the frame of the hoist.
- Never** use the chain stop as an operational limit device.
- Never** operate a hoist if chain is jumping, if there is excessive noise, or if jamming, overloading or binding occurs.
- Never** use a hoist without both load chain anchoring points correctly fitted.
- Never** use a hoist without a name plate/label or with illegible name plate/label.
- Never** use modified or deformed hooks (refer to Chapter 6).
- Never** use a motor to operate a manual lever hoist.
- Never** use a hoist near fire or where hot objects may touch it.
- Never** use the hoist in temperatures below -40°C (-40°F) or above $+50^{\circ}\text{C}$ ($+122^{\circ}\text{F}$).
- Never** adjust or repair a lever hoist unless qualified to perform lever hoist maintenance.
- Never** perform maintenance on the hoist while it is supporting a load
- Never** use the unit for pulling free a jammed load
- Never** allow loads to drop when the chain is in a slack condition (danger of chain breakage and shock loading).
- Never** move the load into areas which are not visible to the operator.
- Never** suspend more than one load lifting attachment in the hook of the hoist.
- Never** reach into moving parts.
- Never** throw a hoist or allow the unit to fall from height. Always place it properly on the ground.
- Never** heat treat nor weld any part of the lever hoist, especially the load chain.
- Never** shock load lever hoist, chain or hook.
- Never** operate the lever hoist unless it is rigged to pull in a straight line from hook to hook.
- Never** lift a load unless the chain is properly seated in the chain wheel(s).
- Never** allow sharp contact between two lever hoists or between the lever hoist and any obstructions.
- Never** drag the chain, lever hoist or hook along the floor or across other objects.



- Never** use the hoist for any unauthorised purpose that is beyond the operation instructions contained in this manual.
- Never** use the chain hoist in acidic conditions.
- Never** pull or tension a lever hoist in a direction that would create side loading against the hook yoke.

2. General Information

The information in this manual is directed to the proper use, care and maintenance of the product and does not comprise a handbook on the broad subject of rigging. Rigging can be defined as the process of lifting and moving heavy loads using hoists and other mechanical equipment. Skill acquired through specialised experience and study is essential to safe rigging operations. Remember, proper rigging and lifting techniques are the responsibility of the operator.

Each Tiger lever hoist is built in accordance with the specifications contained herein and at the time of manufacture complies with our interpretation of applicable sections of the European standard BS EN 13157:004+A1:2009, the Australian standard AS1418.2, the American standard ANSI/ASME B30.21-2005, and the South African standard SANS 1636. Lever hoists supplied with slipping clutch overload protection are compliant with the Norwegian Standard NORSOK R-002. All items come with a test certificate or an EC Declaration of Conformity stating compliance with the essential health and safety requirements of the Machinery Directive 2006/42/EC. Tiger lever hoists are third party verified by SGS Certificate Number MDC 1302.

The Tiger SS11 range of Subsea Lever Hoists are fit for use in a Subsea environment. The SS11 meets and exceeds all the requirements of IMCA DO28 Rev. 1 "Guidance notes for offshore lever hoists".

Unpacking

After opening the carton, the product should be carefully inspected for damage which may have occurred during shipment or handling. Check the hoist frame for dents or cracks and inspect the load chain for nicks and gouges. If shipping damage has occurred, contact your supplier.

! WARNING

Operating a unit with obvious external damage may cause the load to drop and that may result in personal injury and/or property damage. To avoid injury carefully check unit for external damage prior to installation.

Choose the Lever Hoist for the Job

The load capacity indicated on the unit is the maximum working load limit (WLL) that may be attached. Choose a hoist with the capacity for the job. Know the capacities of your loads, then match them. The application, environment it is to be used in, the size and type of load, the attachments to be used and the period of use must also be taken into consideration in selecting the right lever hoist for the job. Remember the lever hoist was designed to ease our burden, and carelessness not only endangers the operator, but in many cases, a valuable load.

Hoists are designed to provide a 4 to 1 safety factor. Supporting structures and load-attaching devices used in conjunction with this hoist must provide an adequate safety factor to handle the rated load, plus the weight of the hoist and attached equipment. This is the customer's responsibility. If in doubt, consult a registered structural engineer.

Inspecting

In addition to regular periodic maintenance inspections all lever hoists should be visually examined before being used. (Refer also to Chapter 5 Inspection). The purpose of pre-use checks is to identify faulty equipment. Hoists are supplied fully lubricated from the factory. Lubrication of the load chain is recommended before initial hoist operation. See Chapter 4 Cross Hauling/Fleeting/Drifting for any usage of Tiger lever hoists that does not involve working in a direct line of pull.



After use

Service the hoist before storing it. See Chapter 8 for more information on storage.

- Clean the hoist thoroughly.
- Keep the hoist well-lubricated. Oil the load chain and hook shank.
- Store the hoist correctly against rain and moisture.

When the hoist is installed outdoors, exceptional care should be taken regarding maintenance. See Chapter 7 Maintenance for more information.

3. Function/Operation

! WARNING

If parts of the hoist are dropped, they can cause injury, death or property damage. Adequately support the hoist during installation.

The hoist may be used at ambient temperatures between -40°C (-40°F) and $+50^{\circ}\text{C}$ ($+122^{\circ}\text{F}$). Consult the manufacturer in the case of extreme working conditions.

Note: Before use at ambient temperatures of less than 0°C , check the brake for freezing by lifting and lowering a small load 2 - 3 times. Before operating the hoist in special atmospheres (high humidity, salty, caustic, alkaline) or handling hazardous goods (e.g. molten compounds, radioactive materials), consult the manufacturer for advice.

Loads can be moved horizontally with the use of a trolley. Always transport the load in the horizontal direction slowly, carefully and close to the ground. Alternatively, refer to the section on Cross Hauling/Fleeting/Drifting (Chapter 4)

Operation

The unique dual brake mechanism featured in the Tiger SS11 and PROLH Lever Hoist enables free movement of the load chain whilst preventing light load slip and accidental load release.

To make slight adjustments to the position of the load chain, move the change lever to the central position marked N (Fig. A). In this position the grip ring can be rotated clockwise or counter clockwise to move the chain up or down.

To make major adjustments to the position of the load chain, move the change lever to the central position marked N and then turn the central free wheel dial to line up with the marks on the grip ring (Fig. B). The load chain can now be pulled through the hoist to the required position.



Figure A



Figure B



If a load is attached to the hoist neither of the free wheel options in Fig. A or Fig. B will operate and the brake will remain active. Following a chain free wheel adjustment the change lever is moved into either the up or down position (Fig. C and D) for lifting or lowering operation.



Figure C



Figure D

Once the chain has been adjusted to required length and the load has been safely attached to the hoist and the desired direction of travel has been chosen by selecting Up or Down (Fig. C and D), lifting and lowering can begin. To commence lifting or lowering, place one hand on the body of the hoist for stability and the other hand on the anti-slip operating handle at the bottom of the lever (Fig. F) and begin operating the ratchet handle to raise or lower the load. Ensure all landing areas are free of obstruction and if necessary use assistance to ensure a safe operation.

Adjustable Chain End Stop

IMCA guidance note D 028 Rev. 1 “The Use of Chain Lever Hoists in the Offshore Environment” requires measures to avoid single point failures in static or multiple rigging points. The Tiger SS11 Lever Hoist is fitted with a travelling chain end stop to specifically address points in section 7.2 of these guidance notes. The travelling chain end stop is available as an option for the PROLH so may be fitted to your hoist. If the end stop is to be used then it should be positioned as shown in Fig. E. Once the load is about to be lowered the chain end stop can be returned to its normal position (Fig. F).



Figure E



Figure F

If a hoist has been left rigged under load for an extended period of time it is good practice to first raise the load slightly before commencing any lowering operations.



! WARNING

Stop operating in the lifting direction when the hook block contacts the hoist body, as noted by the sudden increase in the lever effort or the tipping of the hook block.

The operator must ensure that the hoist is suspended in a manner that makes it possible to operate the unit without exposing himself or other personnel to danger by the unit itself, the suspension or the load.

Stand clear of all loads and avoid moving load over the heads of other personnel. Warn personnel of your intention to move a load in their area. When the unit is not in use, position the suspension (e.g. bottom block, load hook) above normal head height, if possible.

Operating Principle of Overload Protected Lever Hoist

If the lever hoist is fitted with a slipping clutch overload mechanism then it is protected from overload.

The overload protection device is normally set to engage when a load of approximately 135% ($\pm 10\%$) of the WLL is lifted, unless otherwise specified during purchasing. When the load limit is exceeded, the clutch in the chain wheel will slip, allowing the handle to be operated whilst not engaging the gear box. This prevents further lifting of the load, though lowering is still possible.

Continual overloading of the unit must be avoided as the efficiency of the clutch may be impaired. The overload clutch is factory set and should only be adjusted or repaired by a Tiger authorised repairer. If there is any doubt as to the unit's ability to lift a load then don't. Remove the unit from service and have it checked by your local Tiger distributor or service centre.

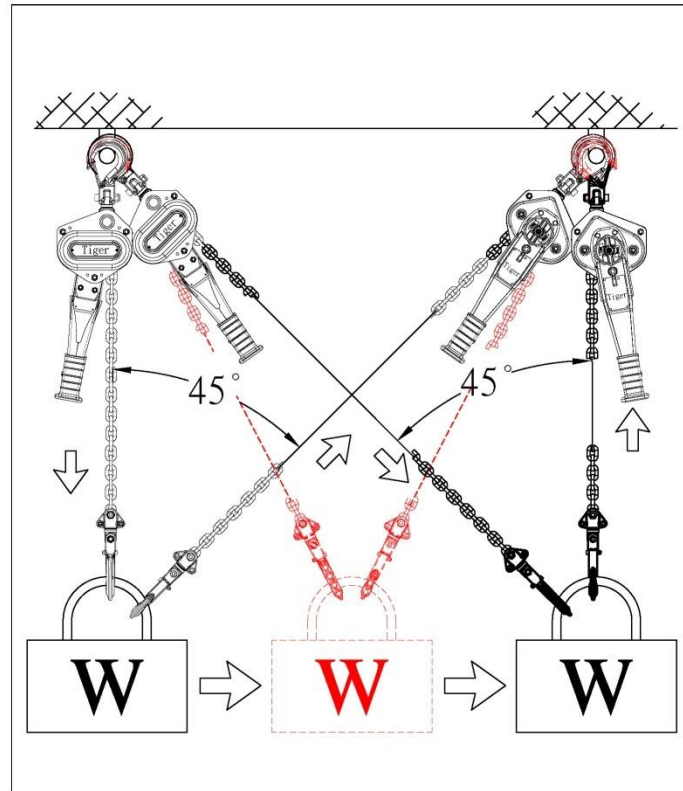
! WARNING

Never disassemble or attempt to adjust the overload limiter assembly. Any attempt to do so will void the warranty.

4. Cross Hauling/Fleeting/Drifting

The SS11 and PROLH ranges of lever hoists fitted with the patent protected twin pawl quad cam brake system have undergone a full and comprehensive testing regime that was drawn up by industry specialists and Tiger's mechanical engineers to provide evidence that these units can be safely used for "fleeting", "drifting" and "cross-hauling" applications up to 45°.

Note: All such operations should be carried out in accordance with manufacturer's instructions and fully risk assessed by a competent person.



As well as following any industry or country specific guidance on lever hoists used at an angle to the vertical, we recommend that before commencing an operation using multiple hoists or involving the transfer of a load from one hoist to another, the following is adhered to:

- All the units that are to be used in such an operation must be of the same make and model and have the same rated capacity.
- Attachment points are critical and the suspension point must have a rated capacity equal to or greater than that of the load to be lifted at the angle that the load will be carried through.
- The attachment points must be designed and certified to work at angles away from the vertical.
- The attachment points must be the correct size to allow the hooks to attach correctly in the bowl of the hook and have enough clearance to allow the hook room to articulate.
- All fleeting operations should be risk assessed by a competent person.
- Load calculations and method statements should be produced.
- Proximity hazards should be accounted for.
- The load chain should be kept free of any twists and must enter the hoist body in a straight line over the load sheave.
- Care should be taken on multi fall hoists to ensure the bottom hook is not capsized/rolled over (i.e. bottom hook has looped through the multi fall chain) which results in the chain becoming twisted.
- When taking up the load or beginning the transfer between hoists particular care should be taken to align the hoist body so that the body, load chain and top and bottom hooks are all in line.
- The top and bottom hooks should be free to rotate within the hook yoke and cannot become trapped or jammed causing stress areas in both the hook and the body.



5. Inspection

According to national and international accident prevention and safety regulations (for example LOLER for the UK), hoisting equipment must be inspected:

- in accordance with the risk assessment of the operating company
- prior to initial operation
- before the unit is put into service for any subsequent use
- after substantial changes
- however, at least once per year, by a competent person.

Note: Actual operating conditions (e.g. operation in galvanizing facilities) can dictate shorter inspection intervals.

The intervals of inspection must be determined by the individual application and are based upon the type of service to which the lever hoist will be subjected.

The SS11 lever hoist meets the requirements of IMCA document D 028 Rev.1 February 2008 section 7.4 immersion policy.

Prior to initial operation, before it is put into operation again and after substantial changes

Before the unit is put into operation, for the first time, for a subsequent use or after substantial repair or modification, unless you have received physical evidence that a thorough examination has been carried out which shows that the lever hoist is safe to use, it should be thoroughly examined by a competent person in compliance with applicable statutory regulations.

Typical pre-use inspection will consist of a visual inspection and a function check. These inspections are intended to establish that the hoist is in a safe condition, has been set up appropriately and is ready for operation, and that any defects or damage are detected and eliminated.

Inspect the lever hoist for operation warning notices and legibility. Deficiencies should be noted and brought to the attention of supervisors. Be sure defective lever hoists are tagged and taken out of service until repairs are made. Under no circumstances should you operate a malfunctioning lever hoist.

The following checks should be carried out before starting work:

Check the unit

- Inspect the unit for visual defects, e.g. deformations, damage, cracks, wear and corrosion marks.
- Check that the name plate/label showing the hoist capacity is attached and clearly legible.
- Check lubrication and lubricate if necessary.
- Check for loose or missing nuts and for missing split pins.

! WARNING

If the brake does not function properly, the unit must be immediately removed from service and placed in a quarantine area until it can be repaired by a relevant competent person.

Inspect the supporting structure and attachment point

Inspect the supporting structure for visual defects, e.g. deformations, damage, cracks, wear and corrosion marks.

The attachment point for the hoist must be selected so that the supporting structure to which it is to be fitted has sufficient stability and to ensure that the expected forces can be safely absorbed. The unit must align freely also under load in order to avoid impermissible additional loading. Check that the hoist and the load are correctly attached. The selection and calculation of the appropriate supporting structure are the responsibility of the operating company.



Inspect the load chain

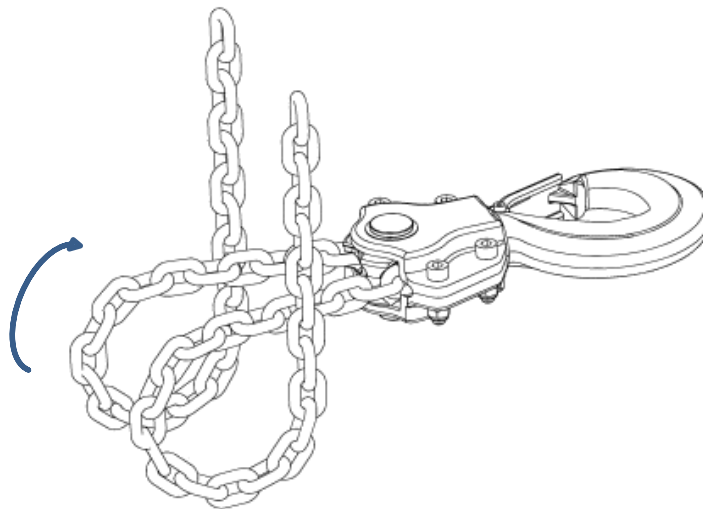
Inspect the load chain for sufficient lubrication, mechanical damage and check for external defects, deformations, superficial cracks, wear, excessive rust and corrosion marks. Check for gouged, twisted and distorted links, and for deposits of foreign material which may be carried into the lever hoist mechanism. Do not operate lever hoists with twisted, kinked or damaged chain links. See Chapter 6 Chain and Hooks.

Inspection of the top hook and bottom load hook

The top and load hooks must be checked for cracks, deformations, damage, wear and corrosion marks. The safety latch must be attached, move freely and be fully functioning. Hooks that are bent, worn or have openings which are enlarged beyond normal throat opening (Chapter 12/Hooks) should not be used. If the latch does not engage in the throat opening of the hook, the lever hoist should be taken out of service. Hooks that do not fulfil all requirements must be replaced immediately. See Chapter 6 Chain and Hooks and Chapter 12 Technical Data/Hooks for more information. Welding on hooks, e.g. to compensate for wear or damage is not permissible.

Inspection of chain reeving in the bottom block

All units with two or more chain falls must be inspected before initial operation to ensure that the load chain is not twisted or kinked. The chains of hoists with two or more falls may become twisted if the bottom block is rolled over "capsized" (i.e. bottom hook has looped through the multi fall chain). A twist in the load chain can damage the lever hoist and cause injury.



Inspection of the load chain anchoring

The load chain anchoring must always be fitted securely at both ends. There must be no wear or incorrect alignment.

And finally, listen (while hoist operates) for unusual sounds which may indicate trouble.



Thorough Examination

Thorough Examination may be needed at several points during the life of the unit: on initial use or following installation, periodically during its life, or following exceptional circumstances. This lever hoist must be subject to periodic thorough examination in compliance with national statutory regulations. The intervals between periodic thorough examinations must consider the following:

- The condition of the unit.
- The environment in which it is to be used.
- The number of lifting operations and loads lifted.

Reports of thorough examination can be based on statutory maximum intervals or via a written examination scheme based on risks and hazards associated with use. i.e.:

- Annual Inspection.
- Period defined by examination scheme.
- Following exceptional circumstance.

Due to the construction of the lever hoist, it will be necessary to partially disassemble the unit to perform the periodic inspections.

Initial inspection and recurring inspections must be documented. Chapter 14 contains the inspection log which must be maintained for each hoist. Any deficiencies noted are to be corrected before the lever hoist is returned to service.

The external conditions may show the need for a detailed inspection which, in turn, may require the use of non-destructive type testing. Any parts that are deemed unserviceable are to be replaced with new parts before the unit is returned to service. It is very important that the unserviceable parts are destroyed to prevent possible future use as a repair item and are properly disposed of.

Note: Only qualified personnel to perform lever hoist maintenance.

6. Chain and Hooks

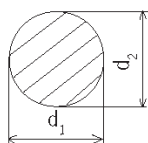
The hooks and load chains are made of special alloy-steels and are precisely heat-treated. Never weld or heat-treat them again.

Load Chain

The load chains are exceptionally long-wearing, but wear is unavoidable and certain conditions will cause wear and corrosion that will lessen the strength. Inspect the load chain for sufficient lubrication, mechanical damage and check for external defects, deformations, superficial cracks, wear and corrosion marks.

Round steel section chains must be replaced when the original nominal thickness 'd' on the chain link with the worst wear has been reduced by more than 10% or when the chain has elongated to a value greater than the discard levels shown in the tables below. There are two alternative tables for either measuring the chain over 21 links or measuring the chain over 7 pitches. Chain should be clean, free of twists and pulled taut before measuring.

Measuring the diameter of the chain



$$d_m = \frac{d_1 + d_2}{2}$$

Replace the chain if $d_m \leq 0.9 \times d$, where d is the normal diameter of the chain wire.



Measuring over 21 links

Capacity (tonnes)	Diameter of Chain Wire $d\phi$ (mm)	Discard if Diameter of Chain Wire $d\phi$ (mm) \leq	Dimensions of Chain (mm) ($d\phi \times P$)	Discard if 21 links (mm) \geq
0.8	6.3	5.7	6.3 \times 19	421.6
1.5	7.1	6.4	7.1 \times 21	467.4
3.0/6.0/10.0/15.0/20.0	10.0	9.0	10 \times 30	668.0

Measuring over 7 pitches

Capacity (tonnes)	Diameter of Chain Wire $d\phi$ (mm)	Discard if Diameter of Chain Wire $d\phi$ (mm) \leq	Dimensions of Chain (mm) ($d\phi \times P$)	Discard if L (mm) \geq
0.8	6.3	5.7	6.3 \times 19	137.0
1.5	7.1	6.4	7.1 \times 21	151.5
3.0/6.0/10.0/15.0/20.0	10.0	9.0	10 \times 30	216.5

Do not knot the load chain or splice/connect it by using pins, bolts, screw drivers or similar. Do not repair load chains installed in the hoist. Protect load chain from weld spatter or other damaging contaminants.

Only fit load chains which have been approved by the manufacturer. Non-compliance with this specification will render the legal warranty or guarantee void with immediate effect. See Chapter 7 Maintenance for more information on maintenance of the load chain.

Hooks

Do not remove the safety latches from top and/or bottom load hooks unless you are replacing them with new latches.

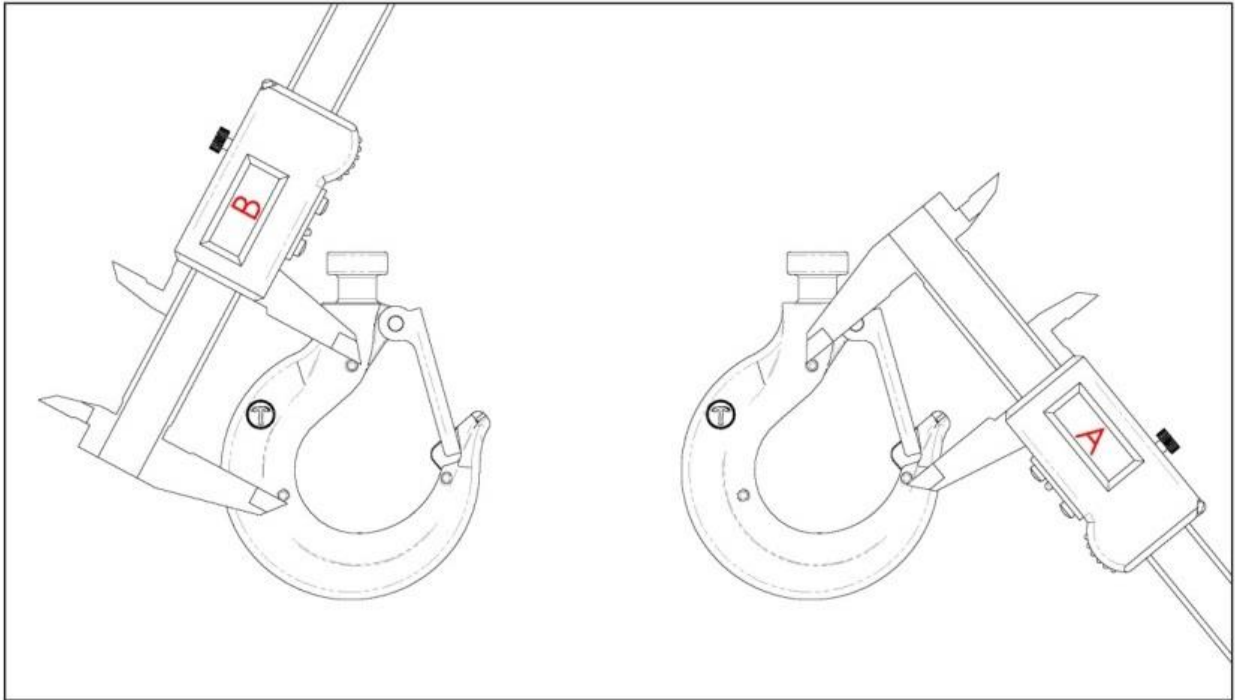
Never mark or hard stamp hooks or any other load bearing parts.

The hook opening will elongate with overloads and incorrect hooking. When the hook measurements have changed beyond the permissible discard limits shown in the table in Chapter 12 Technical Data/Hooks, it is dangerously deformed and must be replaced immediately.

Dye penetrant, magnetic particle inspections (MPI) or other suitable crack detecting inspections should be performed on hooks at least once a year, if external conditions indicate there has been unusual usage.

Newer models of the SS11 and PROLH are fitted with the patent pending Tiger "EZ check" 3 point marking system. With this system a quick check that the A and B measurements are the same (as shown in the diagram below) will indicate if the hooks have stretched. If $A \leq B$ the hook is fine; if $A > B$ the hook needs to be replaced:





7. Maintenance

! WARNING

Never perform maintenance on the hoist while it is supporting a load.

Before performing maintenance attach a notice/tag to the hoist to indicate that it must not be used while maintenance is in progress.

Servicing and repairs should only be carried out by qualified, competent, and responsible people.

After performing any maintenance to the hoist, always perform a functional test before returning to service. After the replacement of components, a subsequent inspection by a competent person is obligatory!

Repair work may only be carried out by a specialist workshop that uses original Tiger spare parts.

Before handling lubricants, read the associated product health and safety data information sheet obtained from the lubricant supplier.

Load Chain

To determine if load chain should be continued in service, check gauge lengths and condition. Chain worn beyond the maximum allowable gauge length (as shown in Chapter 6), nicked, gouged or twisted chain should be replaced before returning the lever hoist to service.



In most cases, chain wear in the link points is caused by insufficient care of the chain. In order to ensure optimal lubrication of the link contact points, lubricate the chain at regular intervals with appropriate lubricant, taking into account the application, temperature range, corrosion resistant properties required and other relevant conditions. It is recommended that you lubricate load chain at least weekly, or more frequently than normal depending on severity of service. Apply new lubricant over existing layer. Lubricate chain more frequently in a corrosive environment. Corrosion resistant chain is available for Tiger lever hoists as an option on SS11 and PROLH models.

A dry film lubricant, e.g. PTFE spray, should be used in environments where abrasives like sand, etc., occur. The service life of the load chain can be increased by careful lubrication to 20 - 30 times, compared with a chain that is not serviced.

When lubricating the chain, make sure the chain is in no-load condition so that the oil can reach the contact points (crown/saddle) of the chain links which are subject to wear. Chain link parts contacting each other must always be coated with lubricant otherwise increased wear on the chain results.

It is not sufficient to lubricate the chains on the outside as this does not ensure that a lubricant film can build up in the contact points.

Make sure that the load chain is lubricated over its entire length, also including the part of the chain in the housing of the hoist around the load sheave/wheel. Remove excess lubricant from the chain by wiping with a cloth.

When lubricating the chain, also check the chain for wear.

Clean dirty chains with acid free or water based solvent or a similar cleaning agent, to remove rust or abrasive dust build up. Never heat the chain.

! WARNING

Make sure that no lubricant can penetrate into the brake enclosure. This may result in failure of the brake.

Replacing the load chain

The load chain must be replaced by a new chain of the same dimensions and quality in the event of visible damage or deformations, or when the discarding status has been reached, at the latest.

A load chain to be discarded must only be replaced by an authorised competent person. Only fit load chains which have been approved by the manufacturer. Non-compliance with this specification will render the legal warranty or guarantee void with immediate effect.

If the chain links are not deformed, the chain can be replaced with the hoist in the suspended position as in the instructions below. Alternatively, remove the hoist from the suspension point and work on a bench. If the chain is jammed in the lifting unit the hoist must be removed and stripped.

Note: Replacement of a load chain must be documented!

Hoist with single fall

1. Only pull in the new chain in no-load condition (if the hoist is not loaded).
2. An open load chain link (split link) is required as a tool. It can be obtained by using an abrasive wheel to cut a section from an existing link with the same dimension. The length of the cut section must at least correspond to the thickness of the link.
3. Remove bottom hook from the old load chain and suspend the open load chain link (split link) in the loose end of the load chain.



4. Suspend the new lubricated load chain also in the open link and pull it in (chain movement UP).
5. Do not fit a twisted chain. The welds must face outwards from the load sheave/wheel.
6. When the old load chain has passed through the hoist unit it can be detached together with the open chain link and the bottom hook can be fitted on the new load chain just pulled in.
7. Fix the slack end of the new load chain on the anchor on the housing or frame (depending on model) of the hoist.

Multi-fall hoists

1. Only pull in the new chain when the bottom block is unloaded, otherwise the bottom block may drop when the load chain is detached. Danger of injury!
2. An open load chain link (split link) is required as a tool. It can be obtained by using an abrasive wheel to cut a section from an existing link with the same dimension. The length of the cut section must at least correspond to the thickness of the link.
3. Detach the loaded-fall (tight/operational) end of the load chain from the top or bottom hook assemblies (depending on model).
4. Suspend the prepared, open load chain link in the now free load chain end.
5. Suspend the new, lubricated load chain also in the open link and pull it through the bottom block and the hoist unit (chain movement UP).
6. Do not fit a twisted chain. The welds must face outwards from the load sheave/ wheel.
7. When the old load chain has passed through the hoist unit it can be detached together with the open chain link.
8. Fix the loaded-fall (tight/operational) end of the new load chain on the housing/frame or on the bottom block (depending on model) of the hoist.
9. Fix the slack end of the idle fall on the hoist instead of the old load chain.

Before returning chain to service or after replacing a load chain, lubricate liberally with chain oil or equal lubricant. Remove excess lubricant from the chain by wiping with a cloth.

Note: Worn chain can be an indication of worn lever hoist components. For this reason, the lever hoist's chain guide roller and load sheave/wheel should be examined for wear and replaced as necessary when replacing worn chain.

! WARNING

Load chains are specially heat treated and hardened and should never be repaired.

The adjustable travelling end stop must always be fitted to the idle end of the chain.

Using other than Tiger supplied or approved load chain may cause the chain to jam in the lever hoist and/or allow the chain to break and the load to drop. Due to the size requirements and physical properties, use only Tiger approved load chain in Tiger lever hoists.

Do not use replaced chain for other purposes such as lifting or pulling. Load chain may break suddenly without visual deformation. For this reason, cut replaced chain into short lengths to prevent use after disposal.

Failure to maintain clean and well lubricated load chain will void the manufacturer's warranty.

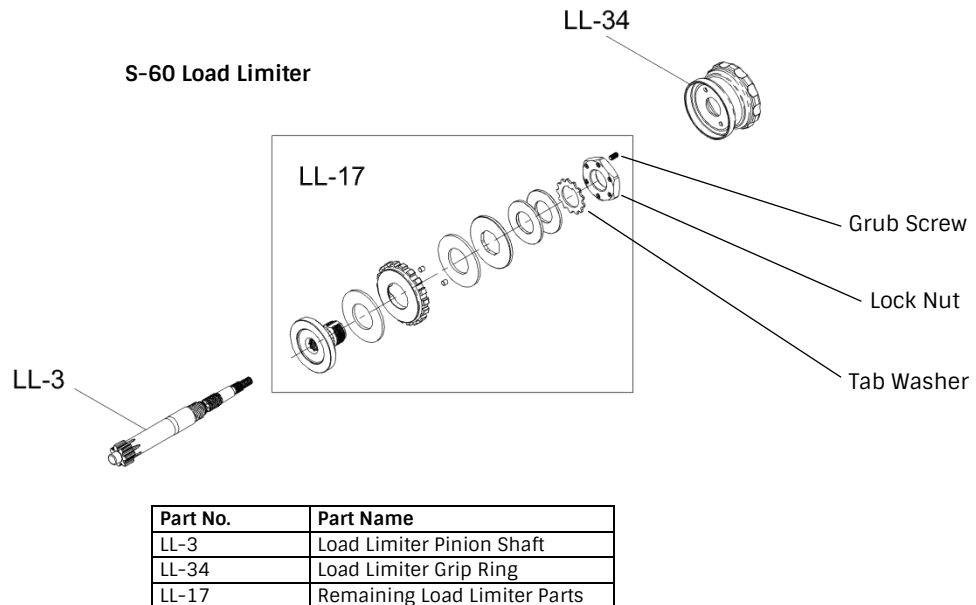
Hooks

With same lubricant used on load chain, lubricate the hook shank and head within the hook yoke and the hook latch pivot points.



Load Limiter

Your SS11 or PROLH may have been supplied with a load limiter, if this has been requested at the time of order.



The load limiter (S-60) is fitted to prevent hoist overload. The device operates by limiting the amount of torque transmitted by the operating handle. It is independent of the hoist brake.

If a load limiter is fitted, items LL-3, LL-17 and LL-34 replace the standard Pinion Shaft (S-03/PRO-03), Grip Ring (S-34/PRO-34) and Change Gear (S-17/PRO-17).

See Chapter 13 for the explosion diagram of the lever hoist without load limiter.

To set the load limiter:

Follow the instructions below to reset a load limiter after servicing or to readjust the torque setting.

If the load limiter components have been disassembled the lever hoist including load limiter parts LL-3 and LL17 will need to be reassembled up to the handle stage. Then follow instructions from number 4 below.

1. To reset the load limiter you will need to remove parts to access the lock nut:
 - S-39/PRO-39 Pinion Nut
 - S-32/PRO-32 Washer
 - S-37/PRO-37 Screw for Guide Plate
 - S-38/PRO-38 Switch Set
 - S-36/PRO-36 Retaining Spring
 - S-35/PRO-35 Guide Plate
 - LL-34 grip ring.
2. Remove the Grub Screw from the Lock Nut with a 2.5mm hex/Allen key.
3. Using a 46mm socket or spanner unscrew the Lock Nut, but do not remove it. This will reset the torque to zero.
4. Suspend the lever hoist from a test machine, using a load cell to monitor the load.

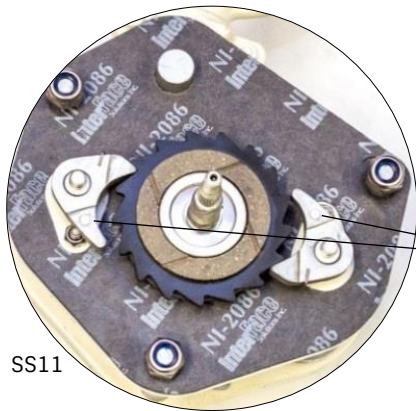


The overload protection device is normally set to engage when a load of approximately 135% ($\pm 10\%$) of the WLL is lifted, unless otherwise specified during purchasing. Determine what your target overload limit is for the unit before you begin to set the overload mechanism.

5. A weight greater than the target load limit is required on the test bed to set the load limiter.
6. Put the handle switch into the up position and start lifting the load.
7. Use the 46mm socket or spanner to tighten the Lock Nut until hand-tight.
8. Operate the handle until the load limiter slips, observing the load cell reading as the load increases.
9. Repeat the process of tightening the Lock Nut and operating the handle, as in steps 7 and 8, and the load will increase in increments until the target overload limit is showing on the load cell without any slippage.
10. Once the target load has been established lower and reload the hoist up to 10 times to ensure consistent readings.
11. Look through the threaded holes on the Lock Nut and locate an unobstructed gap in the Tab Washer.
12. Using a medium strength thread retainer product (threadlocker), place the Grub Screw in this threaded hole in the Lock Nut and through the gap in the Tab Washer and tighten so that the Tab Washer is locked into place.
13. Operate the hoist up and down, lifting and lowering the load, to ensure the target overload is being consistently maintained.
14. Check that the hoist is operating correctly and refit the parts removed in item 1 above.

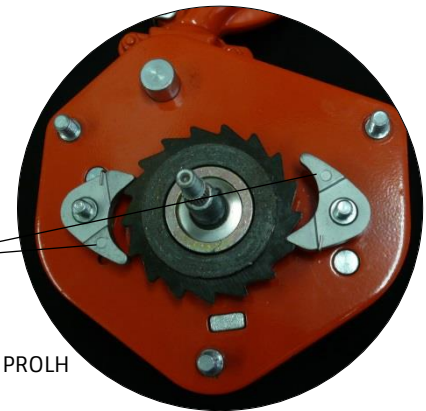
Pawls

When the lever hoist is disassembled for periodic inspections, check the S-12 Brake Pawls for free movement and apply a light coat of grease to the pawl shaft. If you are re-fitting the pawls, make sure that the pawl springs are seated correctly around the pawls and mounting points. The pawls should fully engage into the ratchet gear teeth in the correct orientation as in the images below. Newer versions of the hoist have a dimple indicator on the pawl. The pawl is fitted with the dimple facing you.



SS11

Dimples facing upwards



PROLH

Pinion Shaft

During maintenance it is essential that close inspection is given to Pinion Shaft (S-03/PRO-03) and the Switch Set for Free Wheel (S-38/PRO-38). Refer to Chapter 13 for exploded diagrams and parts. This maintenance can be performed using the following methods:

On a built up unit:

Hold the S-34/PRO-34 Grip Ring and then check for any wear by rotating the S-38/PRO-38 Switch Set left and right and feel for excessive movement on the splines or between the two mating surfaces. As with all mechanical components wear will become evident over time.

On stripped down components:

Hold the pinion shaft (S-03/PRO-03) in a vertical plane and place the S-38/PRO-38 Switch Set onto the splines. Whilst holding the shaft try rotating the S-38/PRO-38 Switch Set left and right on the splines and feel for any excessive wear between the two mating surfaces.



Discard tolerances should be judged by the experience of the technician carrying out the scheduled maintenance, but as a guide, any play on the splines that results in visible movement between the components should be a sign that replacement parts should be fitted.

! WARNING

The practice of shot blasting or any other aggressive cleaning of key component parts such as: S-03, S-05, S-07, S-10, S-11, S-12, S-16, S-17, S-21, S-22, S-27, S-29, S-36, S-38, S-41 (or equivalent parts for PROLH) should not be done as this may have an impact on the items' tolerances and could affect the operation and efficiency of the unit (see exploded diagrams Chapter 13 for part names).

Other Lubrication

When the lever hoist is disassembled for cleaning or repairs, the following locations should be lubricated using suitable grease:

- gears
- load sheave bearings
- load chain roller guides
- gear bearing bushes
- pinion shaft
- inner of ratchet gear being careful not to contaminate the braking surfaces.

The brake is designed to operate unlubricated. Do not use any grease or lubricant on the braking surfaces. When lubricating parts adjacent to the brake, do not use an excessive amount of lubricant as this could seep onto the brake surface.

The grease should be suitable for temperature ranges of -40°C (-40°F) to $+50^{\circ}\text{C}$ ($+122^{\circ}\text{F}$). It should take into account the application, temperature range, corrosion resistant properties required and other relevant conditions.

Thread lubricant or an anti-seize compound use is recommended for threaded shafts, capscrews and nuts. Unless otherwise stated, remove old lubricant, clean part with an acid free solvent and apply a new coating of lubricant to part before assembly.

! WARNING

Using any grease or lubricant on the braking surfaces will cause brake slippage and loss of load control which may result in injury and/or property damage. To avoid injury do not use any grease or lubricant on the braking surfaces. The brake is designed to operate unlubricated.



Alignment of Gears during Reassembly

For 800kg and 1.5t capacity units:

Notice the marks (R&L) on the gears, place "R" gear on right side, "L" gear on left side. These two marks (R&L) must be on horizontal centre line, facing toward centre as shown. (Figure 1)

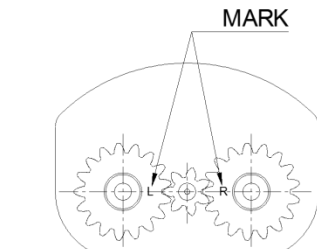


Figure 1

For 3.0t, 6.0t, 10.0t, 15.0t and 20t capacity units:

Note the marks "0" on the gears. For the right gear, place the "0" mark next to the pinion shaft spline on the horizontal centreline. For the left gear, place the "0" mark to the top on the vertical centreline as shown. (Figure 2)

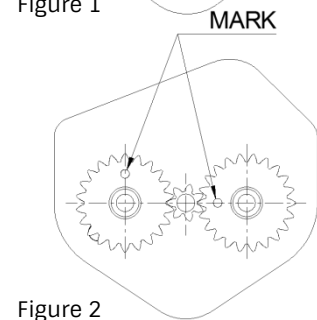


Figure 2

Assembly of the Grip Ring Free Wheel

Refer to Chapter 13 Exploded Diagrams for parts information. Screw the S-34/PRO-34 Grip Ring clockwise onto the S-03/PRO-03 Pinion Shaft until you hear the ratchet gear clicking over the pawls within the hoist. Then move the change lever into the up position. Insert the S-36/PRO-36 Retaining Spring.

With the indicator marks on the top and bottom of the S-34/PRO-34 Grip Ring pointing at the 12 o'clock and 6 o'clock position, fit the S-38/PRO-38 Switch Set for Free Wheel to the first spline to the left side of the first convex grip on the S-34/PRO-34 Grip Ring.

Holding the S-34/PRO-34 Grip Ring and S-38/PRO-38 Switch Set for Free Wheel in position, fit the S-32/PRO-32 Washer and S-39/PRO-39 Pinion Nut and tighten **anti-clockwise**.

Replacing the Brake Discs

Brake discs should be uniform thickness and the thickness should be greater than or equal to 1.5mm. They should be replaced when the thickness is less than 1.5mm or for the SS11 model when the discs have worn to the bottom of the grooves. Pull out the old ratchet gear and brake discs, which are provided as a bonded unit. When you are putting in the new ratchet gear and brake discs, the brake pawls need to be held back as the new item is inserted. Make sure that the pawl springs are seated correctly around the pawls and mounting points. The pawls should fully engage into the ratchet gear teeth in the correct orientation. See the Pawl section earlier in this chapter for the correct orientation of the pawls.

Exterior Finish

The exterior surfaces of the lever hoists have a durable, scratch resistant finish. Normally, the exterior surfaces can be cleaned by wiping with a cloth. Paint damage should be touched up in order to avoid corrosion. All joints and sliding surfaces should be slightly greased. In the case of heavy contamination, the unit must be cleaned using acid free or water based solvent or a similar cleaning agent.

Preventative Maintenance

In addition to the periodic inspection procedure, a preventative maintenance program should be established to prolong the useful life of the lever hoist and maintain its dependability and continued safe use. The program should include the periodic inspections with particular attention being paid to the lubrication of various components using the recommended lubricants.



Testing

Before using, all altered, repaired, or used lever hoists that have not been operated for the previous 12 months, should be tested by the user for proper operation. First test the unit without a load and then with a light load of 2% to be sure that the lever hoist operates properly. Next test with a load of 100% rated capacity. In addition, lever hoists in which load sustaining parts have been replaced should be tested with 100% of rated capacity by or under the direction of an appointed person and a written report prepared for record purposes.

! WARNING

Use only Tiger supplied replacement parts. Parts may look alike; however Tiger parts are made of specific materials, processed to achieve specific properties or precisely machined to fit only Tiger hoists.

Any repairs to this lever hoist must be undertaken by a suitably qualified and competent person. Following any repairs, this lever hoist must be tested in line with relevant standards prior to its reintroduction to service.

8. Transport, Storage, Decommissioning and Disposal

Transporting the unit:

- Do not drop or throw the unit, always deposit it carefully.
- Load chains must be transported in a way to avoid knotting and formation of loops.
- Use suitable transport means. These depend on the local conditions.

Storing or temporarily taking the unit out of service:

To ensure the continuing integrity of the unit you should store the unit in conditions that do not lead to damage or deterioration. Therefore:

- Always store the hoist unloaded.
- The hoist should be secured against unauthorised and unwarranted use.
- Store the unit at a clean and dry place.
- Protect the unit including all accessories against contamination, humidity and damage by means of a suitable cover.
- Protect against corrosion.
- Wipe off all dirt and water.
- A light oil film should be applied to the chains, hook pins and hook latch pins.
- Since the brake disks may freeze at temperature below 0°C, the unit should be stored with closed brake. Turn the handle clockwise to this effect and hold the load fall at the same time.
- If the unit is to be used again after it has been taken out of service, it must first be inspected again by a competent person.

Disposal

When the product comes to the end of its lifecycle, after taking the unit out of service, recycle or dispose of the parts of the unit respecting local and national environmental regulations.



9. Manufacturer Testing and Verification

This product was manufactured under our single-unit control of quality and was passed with strict inspection in accordance with our inspection standards.

Capacity (tonne)	WLL (kg)	Test Load (kg)
0.8	800	1200
1.5	1500	2250
3.0	3000	4500
6.0	6000	9000

Capacity (tonne)	WLL (kg)	Test Load (kg)
10	10000	15000
15	15000	22500
20	20000	25000

Declaration of Conformity

Products are tested in line with the requirements within applicable sections of the European standard BS EN 13157:004+A1:2009, the Australian standard AS1418.2, the American standard ANSI/ASME B30.21-2005, and the South African standard SANS 1636. Lever hoists supplied with slipping clutch overload protection are compliant with the Norwegian Standard NORSOK R-002. All items comply with the essential health and safety requirements of the Machinery Directive 2006/42/EC. Tiger lever hoists are third party verified by SGS Certificate Number MDC 1302.

10. Troubleshooting

Problem	Cause	Solution
Chain is jammed	Load is not being pulled in a straight line	Load chain to be positioned in a straight line
	Load swivel has ceased operating	a) Unload load and de-swivel b) Replace hook assembly
	Hoist is dirty, or hampered with foreign matter	Refer to maintenance and repair section of this manual
	Fall of chain is tangled	Unravel and straighten chain
	Hoist is overloaded	Check the load chain for elongation and replace as required. Load hoist to recommended capacity only
	Brake mechanism has jammed	Return to supplier or authorised service centre for repair
Hoist Seized	Wear and tear	Replace hoist
	Poor maintenance and inspection	Refer to manual for maintenance and inspection details
	Poor storage and handling	Always store unit in a dry and clean area
	Hoist is overloaded	Load hoist to rated capacity only
Slippage of load	Brake mechanism worn	Inspect brake (Chapter 5 Inspection). Replace brake discs or repair brake as described in Chapter 7 Maintenance.
	Hoist is overloaded	Load hoist to rated capacity only
Hoist not braking	Brake mechanism worn	Return to supplier for repair and testing
Load chain catches or jams	Damaged load chain, pinion shaft, gears or sheaves.	Disassemble hoist, inspect and repair or replace damaged components.
	Load chain not installed properly (twisted, kinked or "capsized").	Remove load chain and re-install.
Hook Latch does not work.	Latch broken.	Replace hook latch.
	Load hook bent or twisted.	Inspect load hook as described in Chapter 5 Inspection. Replace if necessary.



11. Product Warranty and Warnings

Definitions

'Customer' means the individual, firm, company or other party with whom the Company contracts;

'Company' means Tiger Lifting UK Limited or Woo Sing Industrial Co., Ltd;

'Contract' the contract between the Company and the Customer for the sale and purchase of this product;

'Defective Goods' goods, parts or materials, which by reason of fault or incorrect design or workmanship, are found to be defective or fail or are unable to perform in accordance with a Contract;

One Year Limited Warranty

The Company makes every effort to assure that its products meet high quality and durability standards and extends the following warranty to the Customer of new products manufactured by the Company:

1. The Company warrants that this product, when shipped, shall be free from defects in materials and workmanship under normal use and service and the Company shall, at its election, repair or replace free of charge any Defective Goods, provided that all claims for defects under this warranty shall be made in writing immediately upon discovery and, in any event, within one (1) year from the date of purchase of this product by the Customer and provided, further, that Defective Goods shall be kept for examination by the Company or its authorised agents or returned to the Company or an authorised service centre upon request by the Company.
2. The Company does not warrant components of products provided by other manufacturers. However to the extent possible, the Company will assign to the "Purchaser" applicable warranties of such other manufacturers.
3. Except for the repair or replacement mentioned in (1.) above, which is the Company's sole liability and Customer's exclusive remedy under this warranty, the Company shall not be responsible for any other claims arising out of the purchase and use of this product, regardless of whether the Customer's claims are based on breach of contract, tort (including negligence), breach of statutory duty, or otherwise, including claims for any loss of profit, goodwill or business opportunity or any indirect or consequential loss arising under or in connection with the Contract.
4. This one year limited warranty is conditional upon the installation, maintenance and use of this product pursuant to the product manuals prepared in accordance with content instructions by the Company. The warranty on this product does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents. This warranty does not apply if the product has been subjected to improper fittings, alignment or maintenance.
5. The Company shall not be responsible for any loss or damage caused by transportation, prolonged or improper storage or normal wear and tear of this product or for loss of operating time.
6. This warranty shall not apply to this product if it has been fitted with or repaired with parts, components or items not supplied or approved by the Company or which have been modified or altered.
7. The Company limits all implied warranties to the period specified above from the date the product was purchased by the Customer.
8. Except as stated herein, any implied warranties or merchantability and fitness are excluded.

If our inspection discloses a defect, the Company will repair, replace the product or refund the purchase price, if we cannot readily or quickly provide a repair or replacement and if you are willing to accept such refund. The Company will return repaired or replacement products at The Company's expense, but if it is determined there is no defect, or that the defect resulted from causes not within the scope of Tiger Lifting's warranty, then the Customer must bear the cost of storing and retrieving the product.

! WARNING

The use of this product is beyond the control of Tiger Lifting. The warranty of this product is limited to the replacement cost of this product should it be found to be defective in material and/or workmanship. The warranty is void if the lever hoist is damaged, worn or used improperly. Normal wear and tear is not considered grounds for replacement. The Tiger Lifting product warranty does not apply where there has been excessive overloading of the lever hoist.

Disclaimer

We believe that the information in this document, including technical information and any advice, is reliable although we give no guarantee as to its accuracy or completeness. The user of our products must determine if the product, either used alone or conjunction with other products, is suitable for their purpose and assumes all risk and liability in connection with those decisions. We have made every effort to make sure this document is accurate. The information contained in this document does not form part of any contract.

Please also refer to our terms and conditions which can be found at: www.tigerlifting.com/terms-conditions/

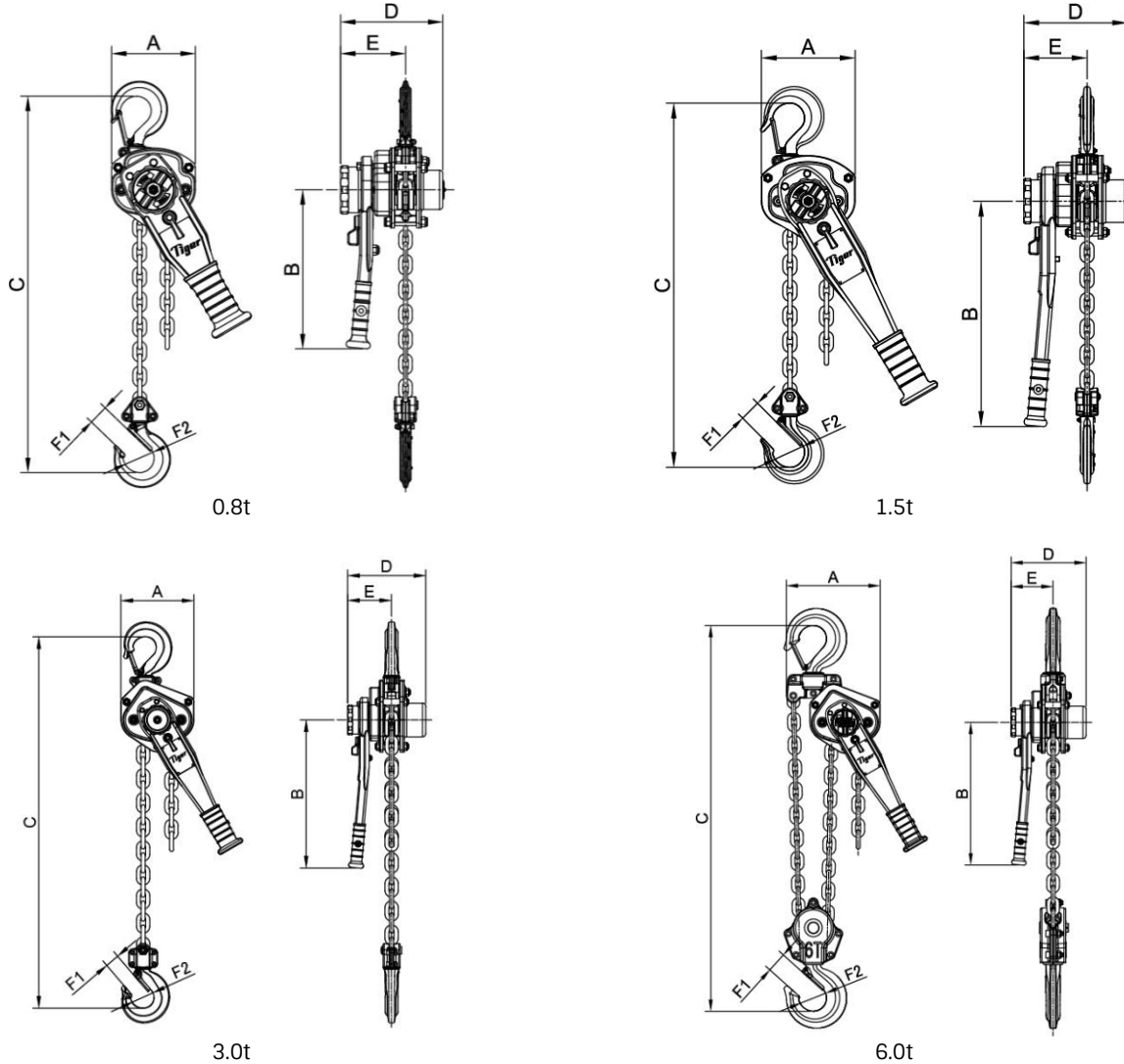


12. Technical Data

SS11 & PROLH Lever Hoists

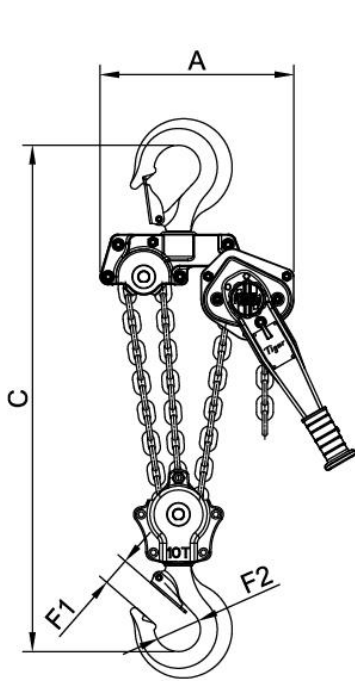
Product Code	Capacity (tonne)	Effort (kg)	Dimensions (mm)							Load Chain		Standard HOL (m) SS11/PROLH	Mass Kg @ std HOL SS11	Mass Kg @ std HOL PLH
			A	B SS11/PLH	C	D	E	F1	F2	Diameter (mm)	No. of falls			
SS-0080/PLH-0080	0.8	23	128	243/236	295	158	99	28	45	∅6.3	1	3/1.5	9.0	7.5
SS-0150/PLH-0150	1.5	26	154	370/360	320	172	104	34	51	∅7.1	1	3/1.5	12.0	10.5
SS-0300/PLH-0300	3.0	38	182	370/360	400	195	108	36	56	∅10.0	1	3/1.5	22.0	18.0
SS-0600/PLH-0600	6.0	40	242	370/360	570	195	108	49	70	∅10.0	2	3/1.5	36.0	29.0
SS-1000/PLH-1000	10.0	47	379	370/360	630	195	108	54	87	∅10.0	3	3/1.5	55.0	45.0
SS-1500/PLH-1500	15.0	44	566	370/360	840	195	108	59	81	∅10.0	5	3/1.5	128.0	112.0
SS-2000/PLH-2000	20.0	49	470	370/360	1050	250	160	81	110	∅10.0	6	3/1.5	174.0	156.0

Drawings shown are for SS11 units. The shape and length of the handle of the PROLH hoist is different.

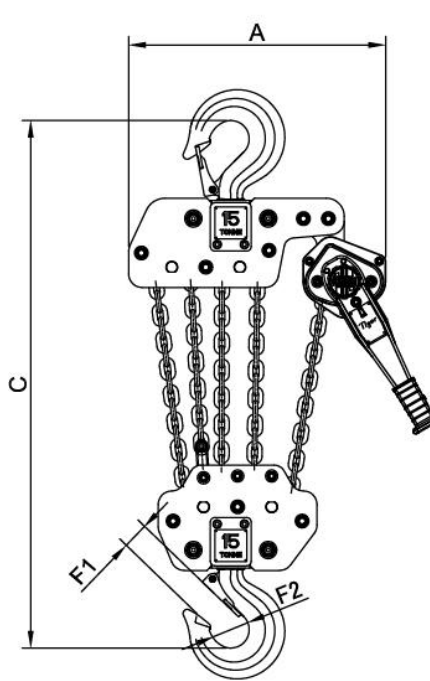
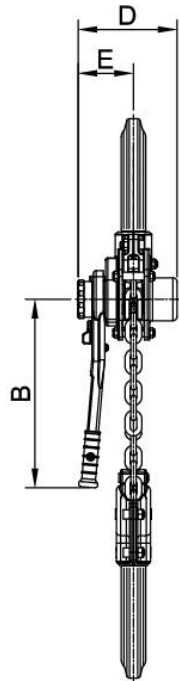




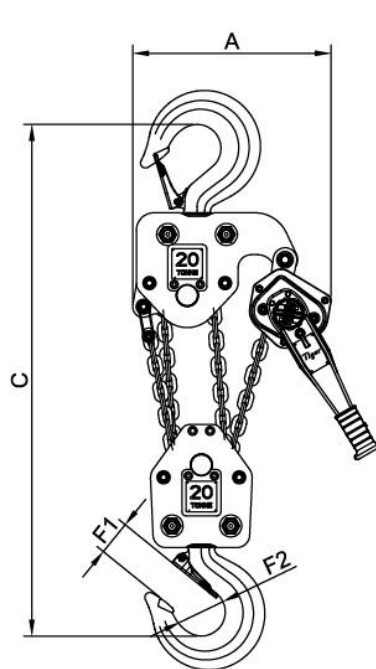
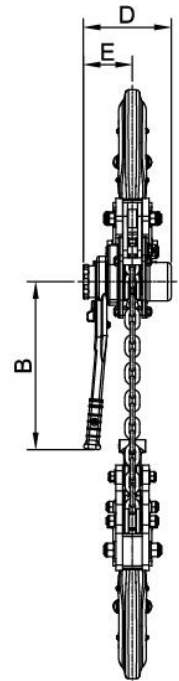
Tiger



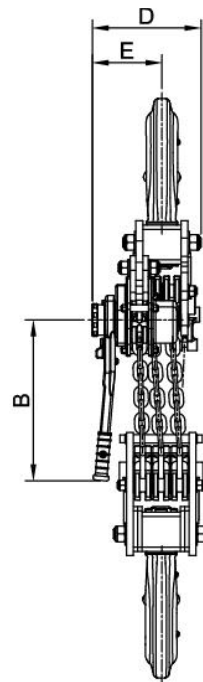
10.0t



15.0t



20.0t

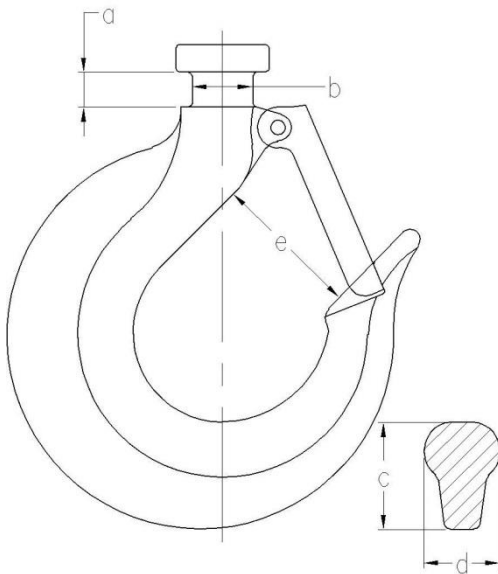




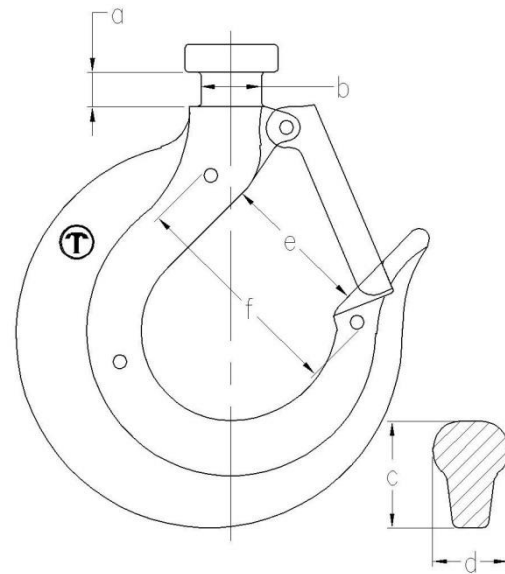
Hooks

The following table shows the normal measurements for the Tiger hooks and the discard limits.

Capacity (Tonnes)	Collar measurements (mm)				Hook thickness at point shown in diagram (mm)				Hook throat Opening (mm)		"EZ Check" measurement (mm)	
	a		b		c		d		e		f	
	Normal	Discard \geq	Normal	Discard \leq	Normal	Discard \leq	Normal	Discard \leq	Normal	Discard \geq	Normal	Discard \geq
0.8	8	8.5	13.5	12.8	23	21.5	17	16	34	37	52	55
1.5	10	10.5	15.5	14.7	26	24.2	21	19.5	39	43	59	63
3.0	12.5	13.5	20	19	37	35	32	30	42	47	76	81
6.0	19	20.5	30	28.5	43	40.5	36	34	58	63.5	86	91.5
10.0	20	21.5	33	31.4	52	49	48	45	70	78	121	129
15.0	-	-	36	34.2	67	63	60	57	67	80	130	143
20.0	-	-	48	45.6	77	72.5	72	68	90	105	162	177



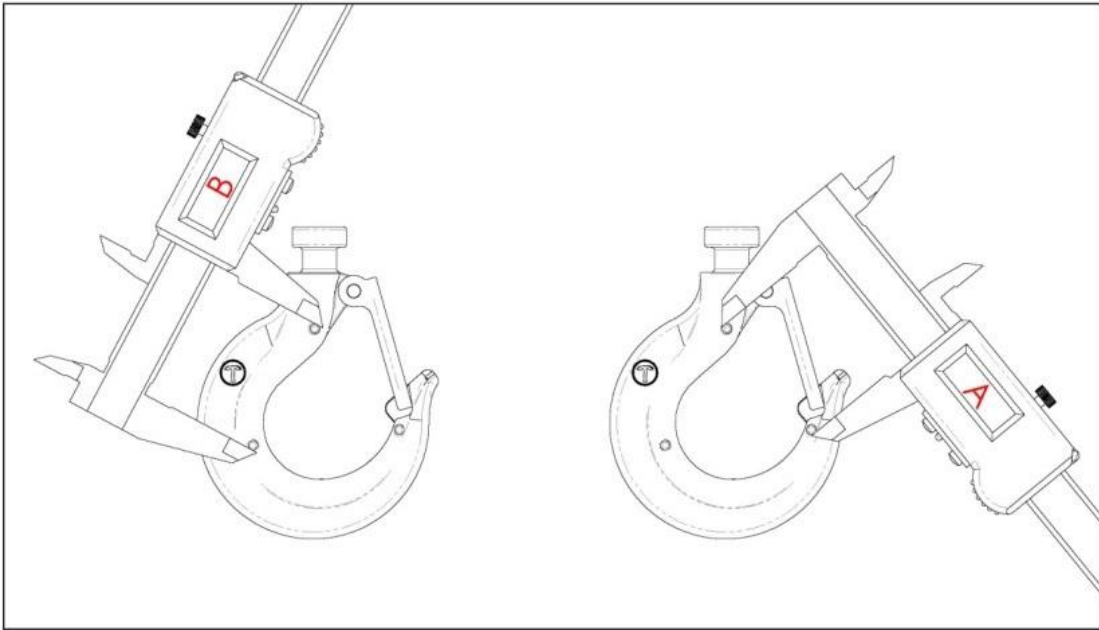
Traditional Tiger Hooks



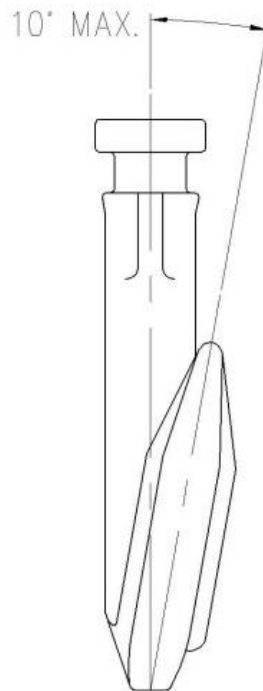
Tiger Hooks with new "EZ Check" 3 point marking system



Newer models of the SS11 and PROLH are fitted with the patent pending Tiger "EZ check" 3 point marking system. With this system a quick check that the A and B measurements are the same (as shown in the diagram below) will indicate if the hooks have stretched. If $A \leq B$ the hook is fine; if $A > B$ the hook needs to be replaced:



In addition to the above checks, more than a 10° twist from the plane of hook is enough to warrant replacement of the hook.

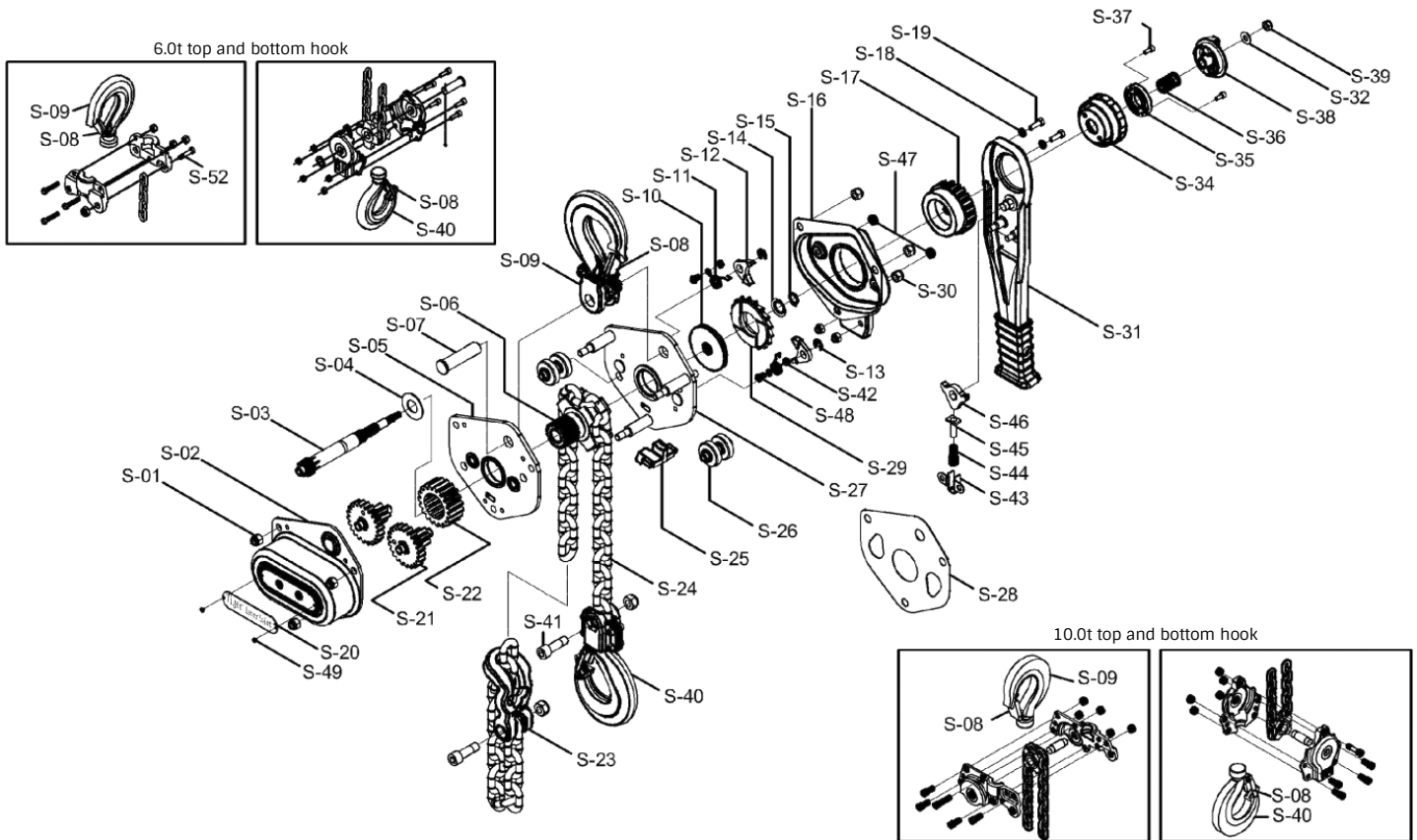




13. Exploded diagrams

SS11 Subsea Lever Hoist

For 800kg, 1.5t, 3.0t, 6t and 10t capacity units:



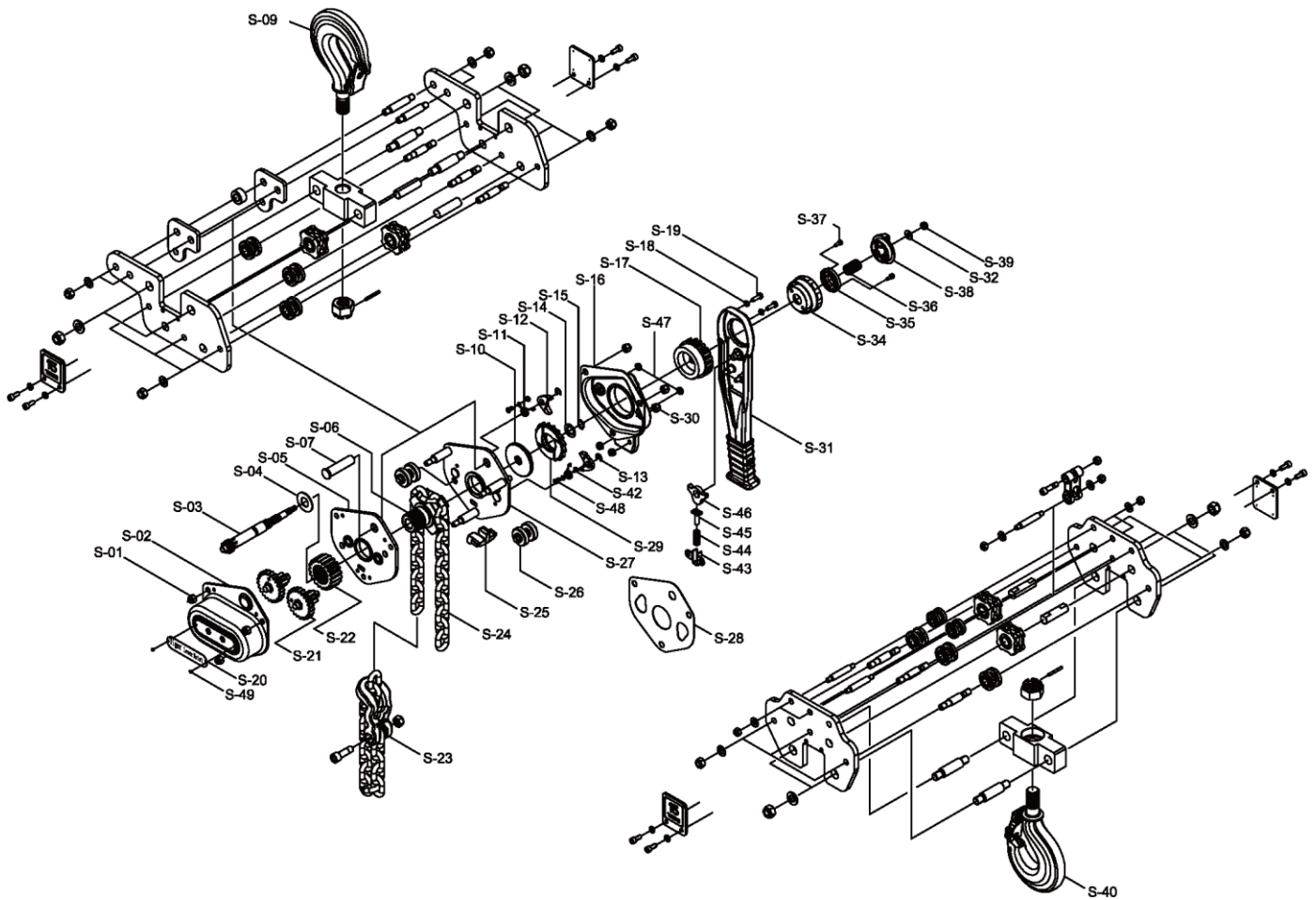
Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
S-01	Nut for Gear Cover	S-17	Change Gear	S-35	Guide Plate
S-02	Gear Cover	S-18	Spring Washer	S-36	Retaining Spring
S-03	Pinion Shaft	S-19	Screw for Handle	S-37	Screw for Guide Plate
S-04	Pinion Shaft Washer	S-20	Label	S-38	Switch Set for Free Wheel
S-05	Gear-side Plate	S-21	Pinion Gear	S-39	Pinion Nut
S-06	New Load Sheave	S-22	Load Gear	S-40	Bottom Hook Assembly
S-07	Top Hook Pin*	S-23	Travelling end stop	S-41	Bottom Hook Pin
S-08	Safety Latch Set	S-25	Chain Stripper	S-42	Nut for Pawl Spring
S-09	Top Hook Assembly	S-26	Load Chain Guide	S-43	Spring Stand
S-10	Disc Hub	S-27	Wheel-side Plate Assembly	S-44	Pushing Up Spring
S-11	Pawl Spring	S-28	Gasket	S-45	Pushing Up Pin
S-12	Brake Pawl	S-29	Ratchet Gear with Brake Disc	S-46	Change Pawl
S-13	Snap Ring for Pawl Pin (800kg/1.5t)	S-30	Nut for Handle Cover	S-47	Nut for Brake Pawl Pin
S-14	Spring Disc	S-31	Handle Assembly	S-48	Screw for Pawl Spring
S-15	Snap Ring for Pinion Shaft	S-32	Washer	S-49	Screw for Label
S-16	Brake Cover with Handle Cover	S-34	Grip Ring	S-52	Chain-End-Fixing Screw (6.0t/20t)

*S-07 Top Hook Pin is fixed to the S-27 Wheel-side Plate Assembly for 800kg and 1.5t capacity units.





For 15t capacity units:

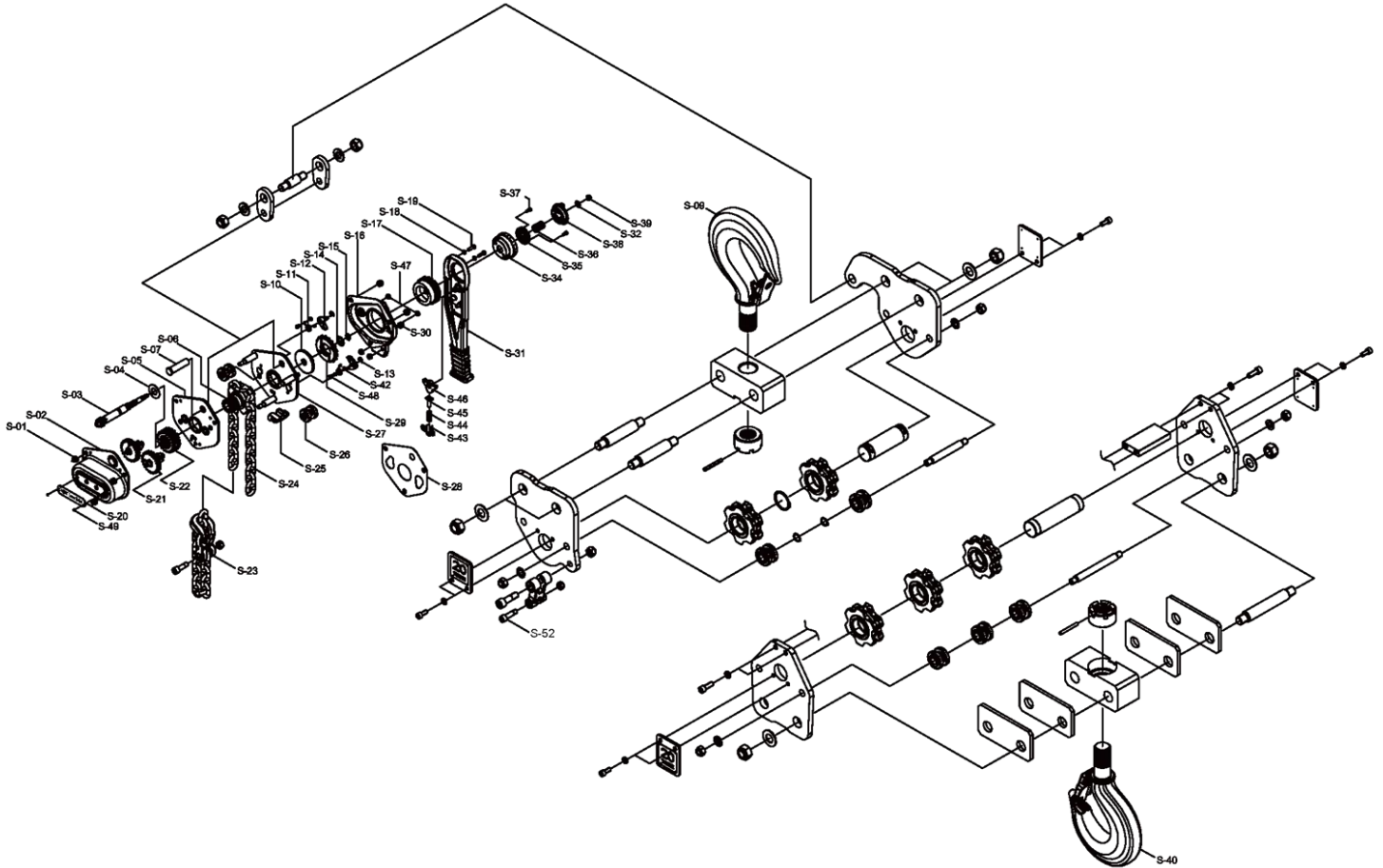


Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
S-01	Nut for Gear Cover	S-18	Spring Washer	S-36	Retaining Spring
S-02	Gear Cover	S-19	Screw for Handle	S-37	Screw for Guide Plate
S-03	Pinion Shaft	S-20	Label	S-38	Switch Set for Free Wheel
S-04	Pinion Shaft Washer	S-21	Pinion Gear	S-39	Pinion Nut
S-05	Gear-side Plate	S-22	Load Gear	S-40	Bottom Hook Assembly
S-06	New Load Sheave	S-23	Travelling end stop	S-41	Bottom Hook Pin
S-07	Top Hook Pin*	S-25	Chain Stripper	S-42	Nut for Pawl Spring
S-08	Safety Latch Set	S-26	Load Chain Guide	S-43	Spring Stand
S-09	Top Hook Assembly	S-27	Wheel-side Plate Assembly	S-44	Pushing Up Spring
S-10	Disc Hub	S-28	Gasket	S-45	Pushing Up Pin
S-11	Pawl Spring	S-29	Ratchet Gear with Brake Disc	S-46	Change Pawl
S-12	Brake Pawl	S-30	Nut for Handle Cover	S-47	Nut for Brake Pawl Pin
S-14	Spring Disc	S-31	Handle Assembly	S-48	Screw for Pawl Spring
S-15	Snap Ring for Pinion Shaft	S-32	Washer	S-49	Screw for Label
S-16	Brake Cover with Handle Cover	S-34	Grip Ring		
S-17	Change Gear	S-35	Guide Plate		





For 20t capacity units:



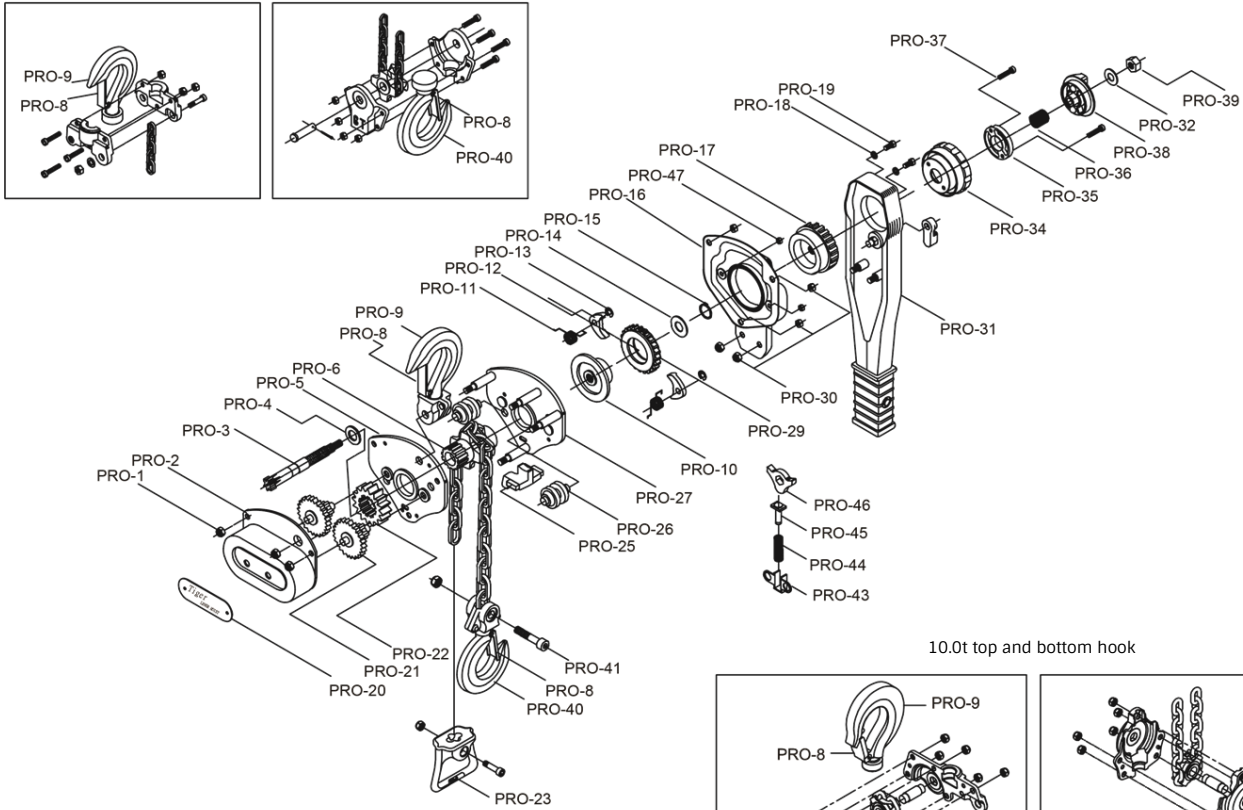
Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
S-01	Nut for Gear Cover	S-18	Spring Washer	S-36	Retaining Spring
S-02	Gear Cover	S-19	Screw for Handle	S-37	Screw for Guide Plate
S-03	Pinion Shaft	S-20	Label	S-38	Switch Set for Free Wheel
S-04	Pinion Shaft Washer	S-21	Pinion Gear	S-39	Pinion Nut
S-05	Gear-side Plate	S-22	Load Gear	S-40	Bottom Hook Assembly
S-06	New Load Sheave	S-23	Travelling end stop	S-41	Bottom Hook Pin
S-07	Top Hook Pin*	S-25	Chain Stripper	S-42	Nut for Pawl Spring
S-08	Safety Latch Set	S-26	Load Chain Guide	S-43	Spring Stand
S-09	Top Hook Assembly	S-27	Wheel-side Plate Assembly	S-44	Pushing Up Spring
S-10	Disc Hub	S-28	Gasket	S-45	Pushing Up Pin
S-11	Pawl Spring	S-29	Ratchet Gear with Brake Disc	S-46	Change Pawl
S-12	Brake Pawl	S-30	Nut for Handle Cover	S-47	Nut for Brake Pawl Pin
S-14	Spring Disc	S-31	Handle Assembly	S-48	Screw for Pawl Spring
S-15	Snap Ring for Pinion Shaft	S-32	Washer	S-49	Screw for Label
S-16	Brake Cover with Handle Cover	S-34	Grip Ring	S-52	Chain-End-Fixing Screw (6.0t/20t)
S-17	Change Gear	S-35	Guide Plate		



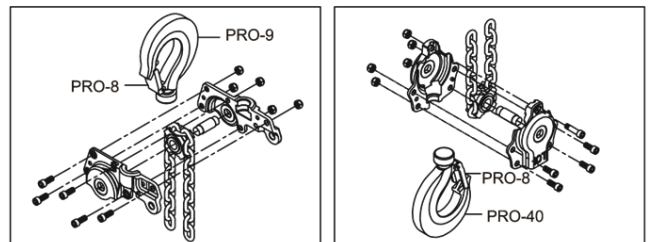


PROLH Professional Lever Hoist

6.0t top and bottom hook



10.0t top and bottom hook

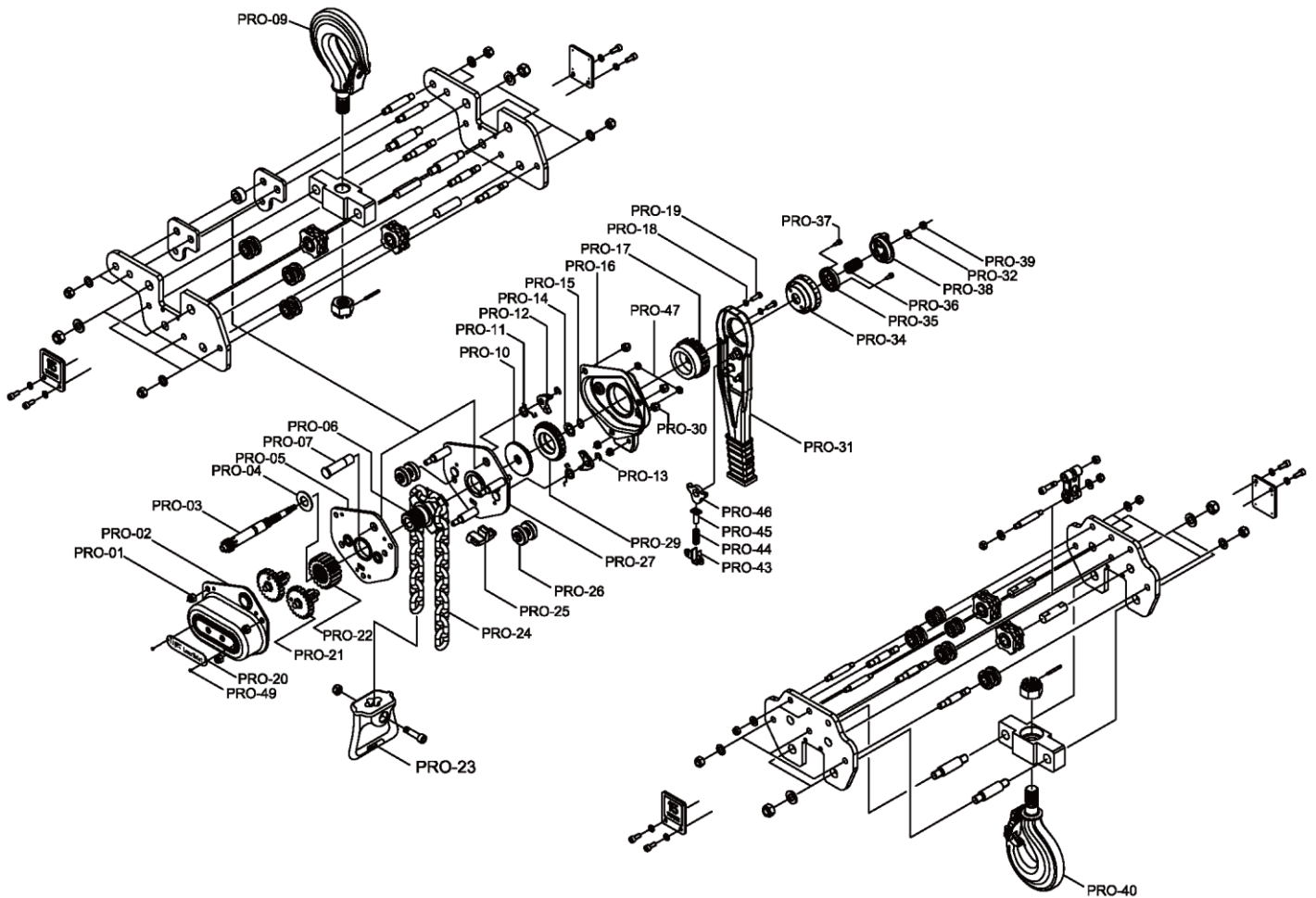


Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
PRO-01	Nut for Gear Cover	PRO-16	Brake Cover with Handle Cover	PRO-34	Grip Ring
PRO-02	Gear Cover	PRO-17	Change Gear	PRO-35	Guide Plate
PRO-03	Pinion Shaft	PRO-18	Spring Washer	PRO-36	Retaining Spring
PRO-04	Pinion Shaft Washer	PRO-19	Screw for Handle	PRO-37	Screw for Guide Plate
PRO-05	Gear-side Plate	PRO-20	Label	PRO-38	Switch Set for Free Wheel
PRO-06	New Load Sheave	PRO-21	Pinion Gear	PRO-39	Pinion Nut
PRO-07	Top Hook Pin*	PRO-22	Load Gear	PRO-40	Bottom Hook Assembly
PRO-08	Safety Latch Set	PRO-23	End stop	PRO-41	Bottom Hook Pin
PRO-09	Top Hook Assembly	PRO-25	New Chain Stripper	PRO-43	Spring Stand
PRO-10	Disc Hub	PRO-26	Load Chain Guide	PRO-44	Pushing Up Spring
PRO-11	Pawl Spring	PRO-27	Wheel-side Plate Assembly	PRO-45	Pushing Up Pin
PRO-12	Brake Pawl	PRO-29	Ratchet Gear with Brake Disc	PRO-46	Change Pawl
PRO-13	Snap Ring for Pawl Pin (800kg/1.5t)	PRO-30	Nut for Handle Cover	PRO-47	Nut for Brake Pawl Pin
PRO-14	Spring Disc	PRO-31	Handle Assembly	PRO-49	Screw for Label
PRO-15	Snap Ring for Pinion Shaft	PRO-32	Washer		

*PRO-07 Top Hook Pin is fixed to the PRO-27 Wheel-side Plate Assembly for 800kg and 1.5t capacity units.



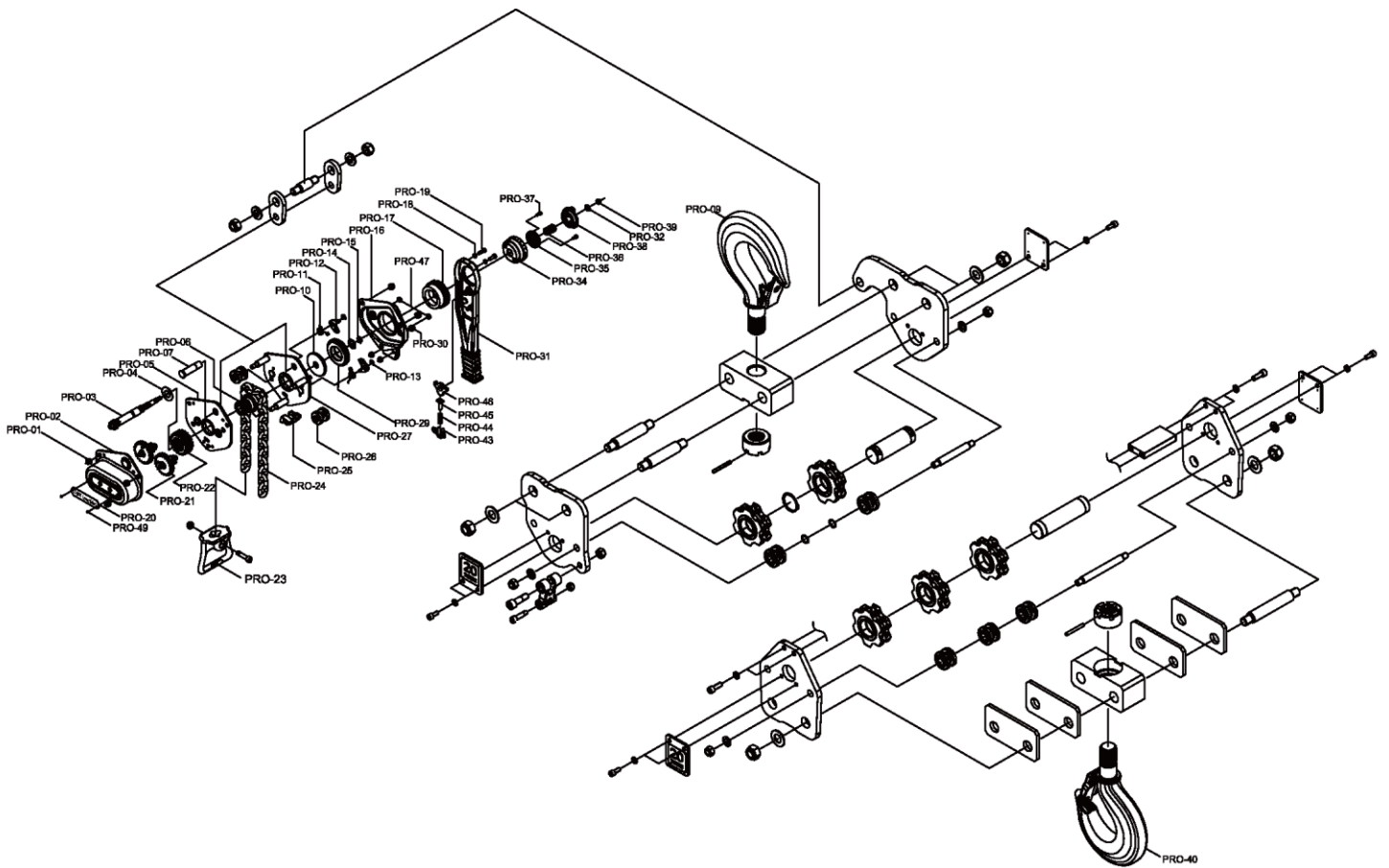
For 15t capacity units:



Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
PRO-01	Nut for Gear Cover	PRO-17	Change Gear	PRO-35	Guide Plate
PRO-02	Gear Cover	PRO-18	Spring Washer	PRO-36	Retaining Spring
PRO-03	Pinion Shaft	PRO-19	Screw for Handle	PRO-37	Screw for Guide Plate
PRO-04	Pinion Shaft Washer	PRO-20	Label	PRO-38	Switch Set for Free Wheel
PRO-05	Gear-side Plate	PRO-21	Pinion Gear	PRO-39	Pinion Nut
PRO-06	New Load Sheave	PRO-22	Load Gear	PRO-40	Bottom Hook Assembly
PRO-07	Top Hook Pin*	PRO-23	End stop	PRO-41	Bottom Hook Pin
PRO-08	Safety Latch Set	PRO-25	New Chain Stripper	PRO-43	Spring Stand
PRO-09	Top Hook Assembly	PRO-26	Load Chain Guide	PRO-44	Pushing Up Spring
PRO-10	Disc Hub	PRO-27	Wheel-side Plate Assembly	PRO-45	Pushing Up Pin
PRO-11	Pawl Spring	PRO-29	Ratchet Gear with Brake Disc	PRO-46	Change Pawl
PRO-12	Brake Pawl	PRO-30	Nut for Handle Cover	PRO-47	Nut for Brake Pawl Pin
PRO-14	Spring Disc	PRO-31	Handle Assembly	PRO-49	Screw for Label
PRO-15	Snap Ring for Pinion Shaft	PRO-32	Washer		
PRO-16	Brake Cover with Handle Cover	PRO-34	Grip Ring		



For 20t capacity units:

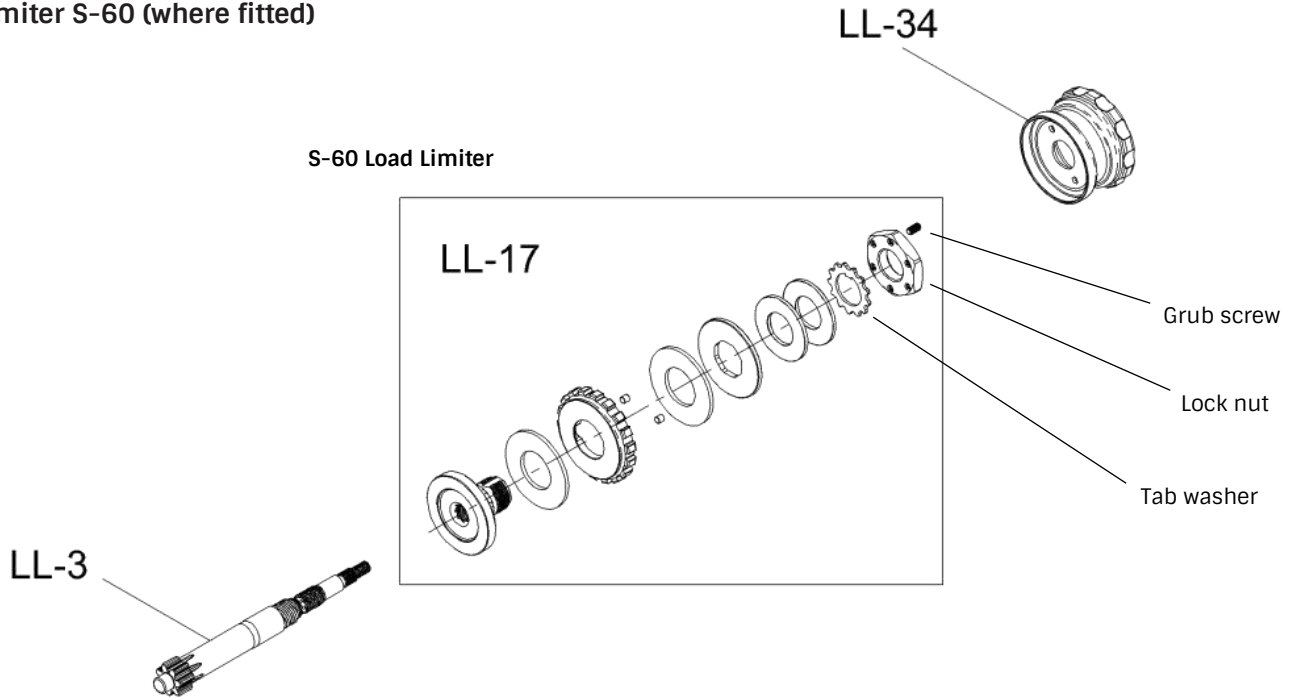


Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
PRO-01	Nut for Gear Cover	PRO-17	Change Gear	PRO-35	Guide Plate
PRO-02	Gear Cover	PRO-18	Spring Washer	PRO-36	Retaining Spring
PRO-03	Pinion Shaft	PRO-19	Screw for Handle	PRO-37	Screw for Guide Plate
PRO-04	Pinion Shaft Washer	PRO-20	Label	PRO-38	Switch Set for Free Wheel
PRO-05	Gear-side Plate	PRO-21	Pinion Gear	PRO-39	Pinion Nut
PRO-06	New Load Sheave	PRO-22	Load Gear	PRO-40	Bottom Hook Assembly
PRO-07	Top Hook Pin*	PRO-23	End stop	PRO-41	Bottom Hook Pin
PRO-08	Safety Latch Set	PRO-25	New Chain Stripper	PRO-43	Spring Stand
PRO-09	Top Hook Assembly	PRO-26	Load Chain Guide	PRO-44	Pushing Up Spring
PRO-10	Disc Hub	PRO-27	Wheel-side Plate Assembly	PRO-45	Pushing Up Pin
PRO-11	Pawl Spring	PRO-29	Ratchet Gear with Brake Disc	PRO-46	Change Pawl
PRO-12	Brake Pawl	PRO-30	Nut for Handle Cover	PRO-47	Nut for Brake Pawl Pin
PRO-14	Spring Disc	PRO-31	Handle Assembly	PRO-49	Screw for Label
PRO-15	Snap Ring for Pinion Shaft	PRO-32	Washer		
PRO-16	Brake Cover with Handle Cover	PRO-34	Grip Ring		





Load Limiter S-60 (where fitted)



Part No.	Part Name
LL-3	load limiter pinion shaft
LL-34	load limiter grip ring
LL-17	remaining load limiter parts



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