Spearhead

QUADSAW
1602/2002/2402

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Part No. 8999106

HANDBOOK & PARTS MANUAL

IMPORTANT

VERIFICATION OF WARRANTY REGISTRATION

DEALER WARRANTY INFORMATION & REGISTRATION VERIFICATION

It is imperative that the selling dealer registers this machine with Spearhead Machinery Limited before delivery to the end user – failure to do so may affect the validity of the machine warranty.

To register machines go to the Spearhead Machinery Limited web site at www.spearheadmachinery.com**, log onto '**Dealer Inside**' and select the '**Machine Registration button**' which can be found in the Service Section of the site. Confirm to the customer that the machine has been registered in the section below.**

Should you experience any problems registering a machine in this manner please contact the Spearhead Service Department on 01789 491867.

Registration Verification

Dealer Name:			
Dealer Address:			
Customer Name:			
Date of Warranty Registration:	/ /	Dealer Signature:	

NOTE TO CUSTOMER / OWNER

Please ensure that the above section has been completed and signed by the selling dealer to verify that your machine has been registered with Spearhead Machinery Limited.

IMPORTANT: During the initial 'bedding in' period of a new machine it is the customer's responsibility to regularly inspect all nuts, bolts and hose connections for tightness and re-tighten if required. New hydraulic connections occasionally weep small amounts of oil as the seals and joints settle in – where this occurs it can be cured by re-tightening the connection – ***refer to torque settings chart below.*** **The tasks stated above should be performed on an hourly basis during the first day of work and at least daily thereafter as part of the machines general maintenance procedure.**

CAUTION: DO NOT OVER TORQUE HYDRAULIC FITTINGS AND HOSES

TORQUE SETTINGS FOR HYDRAULIC FITTINGS

HYDRAULIC HOSE ENDS		
BSP	**Setting**	**Metric**
1/4"	18 Nm	19 mm
3/8"	31 Nm	22 mm
1/2"	49 Nm	27 mm
5/8"	60 Nm	30 mm
3/4"	80 Nm	32 mm
1"	125 Nm	41 mm
1.1/4"	190 Nm	50 mm
1.1/2"	250 Nm	55 mm
2"	420 Nm	70 mm

PORT ADAPTORS WITH BONDED SEALS		
BSP	**Setting**	**Metric**
1/4"	34 Nm	19 mm
3/8"	47 Nm	22 mm
1/2"	102 Nm	27 mm
5/8"	122 Nm	30 mm
3/4"	149 Nm	32 mm
1"	203 Nm	41 mm
1.1/4"	305 Nm	50 mm
1.1/2"	305 Nm	55 mm
2"	400 Nm	70 mm

WARRANTY POLICY

WARRANTY REGISTRATION

All machines must be registered, by the selling dealer with Spearhead Machinery Ltd, before delivery to the end user. On receipt of the goods it is the buyer's responsibility to check that the Verification of Warranty Registration in the Operator's Manual has been completed by the selling dealer.

1. LIMITED WARRANTIES

1.01. All machines supplied by Spearhead Machinery Limited are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months, unless a different period is specified.

1.02. All spare parts supplied by Spearhead Machinery Limited are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months.

1.03. The manufacturer will replace or repair for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined.

1.04. This warranty does not apply to any part of the goods, which has been subjected to improper or abnormal use, negligence, alteration, modification, fitment of non-genuine parts, accident damage, or damage resulting from contact with overhead power lines, damage caused by foreign objects (e.g. stones, iron, material other than vegetation), failure due to lack of maintenance, use of incorrect oil or lubricants, contamination of the oil, or which has served its normal life. This warranty does not apply to any expendable items such as blades, flails, bushes, belts, flap kits, skids, shields, guards, wear pads or pneumatic tyres.

1.05. Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.

1.06. Warranty on hoses is limited to 12 months and does not include hoses which have suffered external damage. Only complete hoses may be returned under warranty, any which have been cut or repaired will be rejected.

1.07. Machines must be repaired immediately a problem arises. Continued use of the machine after a problem has occurred can result in further component failures, for which Spearhead Machinery Ltd cannot be held liable, and may have safety implications.

1.08. Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of Spearhead Machinery Ltd.

1.09. For machine warranty periods in excess of 12 months the following additional exclusions shall apply:

1.09.1. Hoses, external seals, exposed pipes and hydraulic tank breathers.
1.09.2. Filters
1.09.3. Rubber mountings
1.09.4. External electric wiring.
1.09.5. Labour and mileage costs.

1.10. All service work, particularly filter changes, must be carried out in accordance with the manufacturer's service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.

NB Warranty cover will be invalid if any non-genuine parts have been fitted or used. Use of non-genuine parts may seriously affect the machine's performance and safety. Spearhead Machinery Ltd cannot be held responsible for any failures or safety implications that arise due to the use of non-genuine parts.

2. REMEDIES AND PROCEDURES

2.01. The warranty is not effective unless the Selling Dealer registers the machine, via the Spearhead Machinery web site and confirms the registration to the purchaser by completing the confirmation form in the operator's manual.

2.02. Any fault must be reported to an authorised Spearhead Machinery dealer as soon as it occurs. Continued use of a machine, after a fault has occurred, can result in further component failure for which Spearhead Machinery Ltd cannot be held liable.

2.03. Repairs should be undertaken within two days of the failure. Claims submitted for repairs undertaken more than 2 weeks after a failure has occurred, or 2 days after the parts were supplied will be rejected, unless the delay has been authorised by Spearhead Machinery Ltd.

2.04. All claims must be submitted, by an authorised Spearhead Machinery Service Dealer, within 30 days of the date of repair.

2.05. Following examination of the claim and parts the manufacturer will pay, at their discretion, for any valid claim the cost of any parts and an appropriate labour allowance if applicable.

2.06. The submission of a claim is not a guarantee of payment.

2.07. Any decision reached by Spearhead Machinery Ltd is final.

3. LIMITATION OF LIABILITY

3.01. The manufacturer disclaims any express (except as set forth herein) and implied warranties with respect to the goods including, but not limited to, merchantability and fitness for a particular purpose.

3.02. The manufacturer makes no warranty as to the design, capability, capacity or suitability for use of the goods.

3.03. Except as provided herein, the manufacturer shall have no liability or responsibility to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the goods including, but not limited to, any indirect, special, consequential, or incidental damages resulting from the use or operation of the goods or any breach of this warranty. Notwithstanding the above limitations and warranties, the manufacturer's liability hereunder for damages incurred by the purchaser or others shall not exceed the price of the goods.

3.04. No action arising out of any claimed breach of this warranty or transactions under this warranty may be brought more than one (1) year after the cause of the action has occurred.

4. **MISCELLANEOUS**

4.01. The manufacturer may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.

4.02. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.

4.03. Applicable law may provide rights and benefits to the purchaser in addition to those provided herein.

This machine is produced by Greentec A/S on behalf of Spearhead Machinery Limited.

CE Declaration of Conformity, Conforming to EU Machinery Directives 2006/42/EF

We, GreenTec A/S, Merkurvej 25, DK-6000 Kolding hereby declare that:

Product .....

Product Code.....

Serial No.....

Type.....

Manufactured by: GreenTec A/S, Merkurvej 25, DK-6000 Kolding

In terms of its design, method of construction and execution thereof, the item of machinery described above complies with the basic health and safety regulations of the respective EU Directives. The Machinery Directive is supported by the following harmonized standards:

- DS/EN ISO 12100 3rd edition 2011. Safety of Machinery – General principles for design – Risk assessment and risk reduction.
- DS/EN 953+A1 4th edition 2010. Safety of Machinery – Guards – General requirements for the design and construction of fixed of moveable guards.
- DS/EN ISO 4413 1st edition 2010. Hydraulic fluid power – General rules and safety requirements for systems and their components

The EC Declaration only applies if the machine stated above is used in accordance with the operating instructions.

Signed

(On behalf of GreenTec A/S)

Status Sales Director

Date .....

CONTENTS

INTRODUCTION

The Spearhead Quadsaw blade saw is a professional attachment designed specifically for the cutting of trees and branches and developed for the discerning customer with a focus on cutting performance, efficiency and output and working environment.

Available in width of 1.6 m (1602), 2.0 m (2002) and 2.4 m (2402) the attachment is equipped with either 400 mm(1602), 500 mm (2002) or 600 mm(2402) 'belt-driven' blades which have the ability to cut multiple branches up to a maximum diameter of 70mm (1602), 80mm (2002) and up to 120mm (2402). For single branches passing through the Quadsaw at any one time these sizes can be increased to 100 mm (1602), 120 mm (2002) and 160 mm (2402).

Important Note

The information contained in this manual is correct at the time of publication. However, in the course of constant development, changes in specification are inevitable. Should you find the information given in this book different to the machine it relates to please contact the "After Sales Department" for advice.

Please ensure that this manual is handed to the operator before using the machine for the first time. The operator must fully understand the contents of this manual before using this machine.

<u>If the machine is resold the Manual must be given to the new operator</u>

GENERAL INFORMATION

Read this manual before fitting or operating the machine or accessory. Whenever any doubt exists contact your local dealer or the Spearhead Machinery Service Department for assistance.

Only use 'Genuine Spearhead Parts' on Spearhead Machinery and equipment.

DEFINITIONS: *The following definitions apply throughout this manual;*

DANGER: Alerts to a hazardous situation which will result in death or serious injury if not observed carefully.

WARNING: Alerts to a hazardous situation which will result in death or serious injury if not observed carefully.

CAUTION: Alerts to a hazardous situation which could result in damage to the machine and/equipment if not observed correctly.

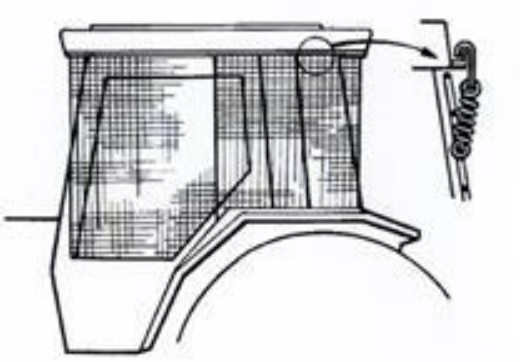
NOTICE: Specific or general information considered important or useful to emphasise.

LEFT HAND (LH) & RIGHT HAND (RH): These terms are applicable to the machine when fitted to the tractor and viewed from the rear; these terms also apply to the tractor references.

SERIAL PLATE
All machines are equipped with a serial plate containing important information relating to the machine including a unique serial number used for identification purposes.

Note: Images in this manual are provided for instruction and information purposes only and may not show components in their entirety. In certain instances images may appear different to the actual machine; when this occurs the general procedure will be basically the same.

VEHICLE/TRACTOR PREPARATION



We recommend vehicles are fitted with cabs using ‘safety glass’ windows and protective guarding when used with our machines. Fit an Operator Guard such as Spearheads’ available guard kit (part number OPT0603) and using the hooks provided fit it to the vehicle. Shape the mesh to cover all vulnerable areas. The driver must be looking through mesh and/or polycarbonate glazing when viewing the complete working machine in any working position – unless the vehicle/cab manufacturer can demonstrate that the penetration resistance is equivalent to, or higher than, that provided by mesh/polycarbonate glazing. If the tractor has a roll bar only, a frame must be made to carry both mesh and polycarbonate glazing. The operator should also use personal protection equipment (PPE) to reduce the risk of serious injury such as; eye protection (mesh visor to EN1731 or safety glasses to EN166), hearing protection to EN352, safety helmet EN297, gloves and high visibility clothing.

Vehicle Ballast

It is imperative when attaching ‘third-party’ equipment to a vehicle that the maximum possible stability can be accomplished by the utilisation of ‘ballast’ in order to counter-balance the additional equipment added. Quadsaw Branch Cutters have been tested on the following reach arm systems: Spearhead Twiga MID, PRO & FLEX with tractors from 4400kg, wheelbase of 250 cm and a track width of 200 cm measured from/to the outer edge of the tyre till tractors of 5500kg, wheelbase of 280cm and a track width of 250cm measured from/to the outer edge of the tyre. Because there are different types of tractor structures and differences in weight distribution you must view this as a “guideline”. Is it possible, then choose wide tyres as possible to increase the stability of the vehicle.

Front Weights

May be required for rear mounted machines to place 15% of total outfit weight on the front axle for stable transport on the road and to reduce ‘crabbing’ due to the drag of the cutting unit when working on the ground.

Rear Weights

May be required to maintain a reasonable amount of rear axle load on the Opposite wheel from the arms when in work; for normal off-ground work i.e. hedge cutting this should be 20% of rear axle weight or more for adequate control, and for ground work i.e. verge mowing with experienced operators, this can be reduced to 10%. All factors must be addressed in order to match the type and nature of the equipment added to the circumstances under which it will be used – in the instance of reach arm hedge cutters it must be remembered that the machines centre of gravity during work will be constantly moving and will differ from that during transport mode, therefore balance becomes critical.

Factors That Affect Stability

- Centre of gravity of the tractor/machine combination.
- Geometric condition e.g. position of the cutting head and ballast.
- Weight, track width and wheelbase of the tractor.
- Acceleration, braking, turning and the relative position of the cutting head during these operations.
- Ground conditions, e.g. slope, grip, load capability of the soil/surface.
- Rigidity of implement mounting.

Suggestions To Increase Stability

- Increasing wheel track; a vehicle with a wider wheel track is more stable.
- Ballasting the wheel; it is preferable to use external weights but liquid can be added to around 75% of the tyre volume – water with anti-freeze or the heavier Calcium Chloride alternative can be used.
- Addition of weights – care should be taken in selecting the location of the weights to ensure they are added to a position that offers the greatest advantage.
- Front axle locking (check with tractor manufacturer).

NOTE: The advice above is offered as a guide for stability only and is not a guide to vehicle strength. It is recommended that you consult your vehicle manufacturer or local dealer to obtain specific advice on this subject, additionally advice should be sought from a tyre specialist with regard to tyre pressures and ratings suitable for the type and nature of the machine you intend to fit.

SAFETY FOR MAINTENANCE & OPERATOR

The safety advice in this manual, the present national emergency preventing precepts and existing in-house work, operation and safety precepts must be complied with.

Additionally the safety precepts of the vehicle manufacturer must be complied with. If the machine is used on public roads, the existing laws apply.

Safety Advice For Maintenance And Inspection:

- The head of operations must see it that all maintenance, inspections and fittings are carried out by authorized personnel who have read and understood the contents of this manual.
- Maintenance must only be carried out when the machine is at standstill. This procedure as described in Spearheads' manual must be carefully observed.
- When maintaining a Quadsaw and/or a machine that is lifted, always secure with suitable support units.
- When replacing blades and the like always check the hydraulic system for remaining pressure; always reduce the pressure to zero.
- Only use suitable tools and always wear work gloves, safety shoes and goggles.
- Dispose of oil and grease according to regulation.
- Immediately after finishing work, all safety and protection units must be installed and activated again.
- Before any use, the sections "Putting Into Operation" by the manufacturer of the tractor/vehicle must be carefully followed.

Safety Advice For The Head Of Operation/User:

- It is of the most utmost importance to be familiar with the equipment and the operational units before starting work. Afterwards it is too late.
- Work wear must be tight fitted. Avoid loose fitted clothes. Check surroundings before work (children or obstacles such as rocks, fence posts, wire etc.). Always make sure there is a sufficient view. Safety distance for a tool in work is stated in the manual.
- Riding the Quadsaw or machine when transported or in work is not permitted.
- Never leave the driver's seat when driving.
- Staying in the work area is forbidden. Safety distance for the Quadsaw is stated in the manual.
- Take extra precautions when working underneath power lines. Always keep a safe distance to power lines.
- Before leaving the vehicle, always lower machine/Quadsaw to the ground, remove the ignition key and secure the vehicle from inadvertent activation and rolling!

SAFETY AND INSTRUCTIONAL DECALS IDENTIFICATION

Warning
Avoid fluid escaping under pressure. Consult technical manual for service procedures.

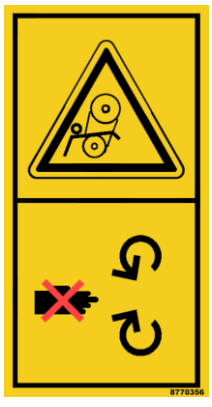
Warning
Stop engine and remove key before performing maintenance or repair work.

Warning
Danger – flying objects. Keep safe distance from the machine as the engine is running.

Warning
Check all nuts and bolts are tight every 8 hours – retighten if required.

Warning
Stay clear of rotating saw blades.

Warning
Carefully read operators manual before handling this machine. Observe instructions and safety rules when operating.



Warning
Do not remove/open guard when parts are rotating.

Warning
Do not stand and ride on the machine at any time.

ADDITIONAL SAFETY ADVICE

Training
Operators need to be competent and fully capable of operating this machine in a safe efficient way prior to attempting to use it in any public place. We advise therefore that the prospective operator make use of relevant training courses available such as those run by the Agricultural Training Board, Agricultural Colleges, Dealers and Spearhead.

Working In Public Places
When working in public places such as roadsides, consideration should be paid to others in the vicinity. Stop the machine immediately when pedestrians, cyclists and horses etc. pass. Restart only when they are at a distance that causes no risk to their safety.

Warning Signs
It is advisable that any working area be covered by suitable warning signs and statutory in public places. Signs should be highly visible and well placed in order to give clear advanced warning of the hazard. Contact the Department of Transport of your Local Highway Authority to obtain detailed information on the subject. The latter should be contacted prior to working on the public highway advising them of the time and location of the intended work asking what is required by the way of signs and procedure – 'Non-authorised placement of road signs may create offences under the Highways Act'.

Suggested Warning Signs Required
The reach arm machine must be fitted with a white on blue, 600mm diameter ***'Keep Left'*** (*) direction arrow. A white with red border ***'Hedge Cutting'*** warning triangle of at least 750mm tall must be placed at no greater distance than 500m from the tractor at any time. These hedge cutting signs should also be placed at key restricted view areas such as bridges and sharp bends.

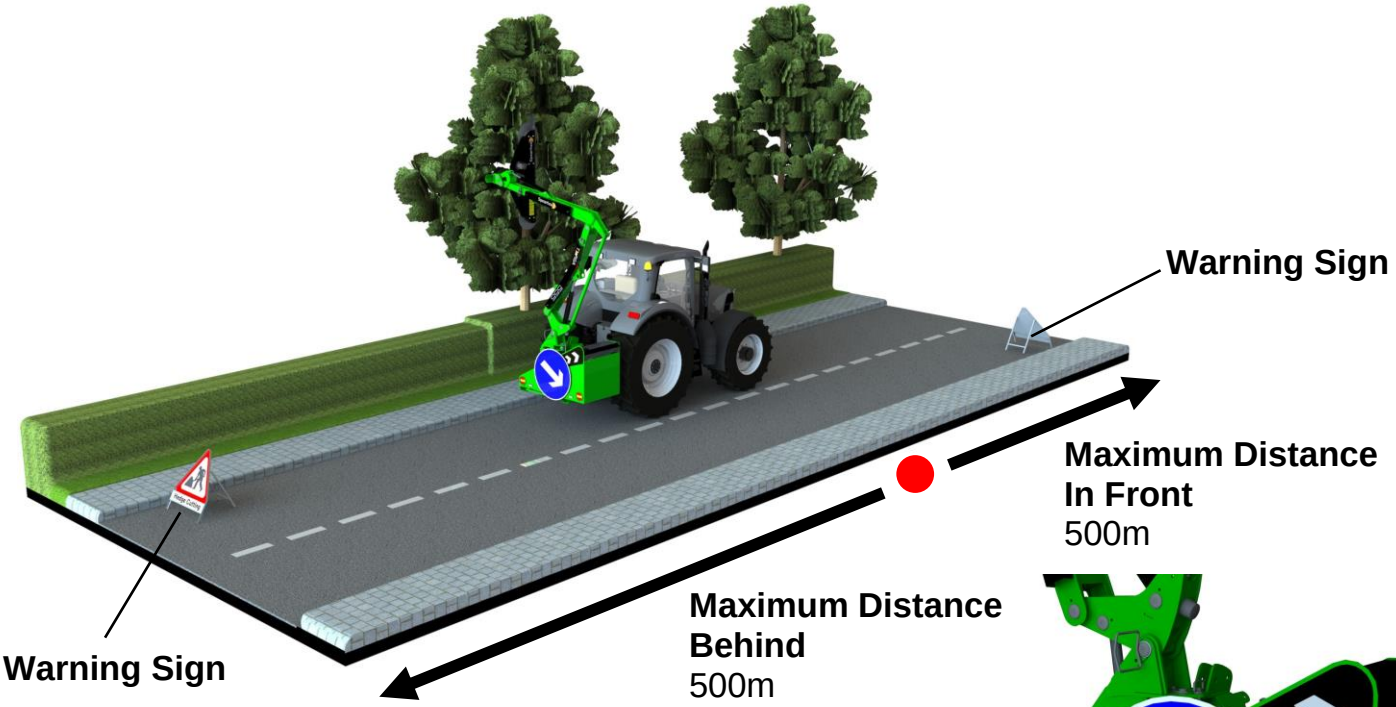
NOTE – this applies to UK Market machines where traffic passes to the right of a machine working in the same direction as the traffic flow. The direction, use and colour of the arrow depend on the country of use and the Local Highway Authorities regulations in the locality.

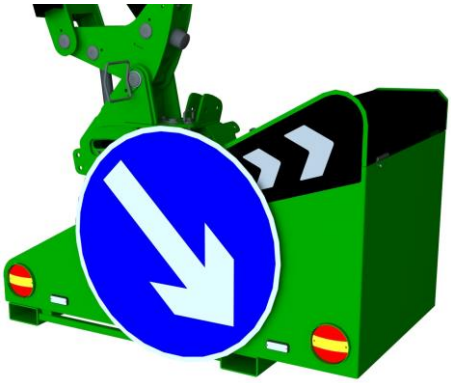
Use of Warning Signs

- On two-way roads, one set of signs is required to be facing in each direction.
- Work should be carried out within 500m of the signs. The signs will then be required to be moved.
- Work only when visibility is good and at times of flow e.g. NOT during 'rush-hour'.
- Vehicles should have at least one 360° visible amber flashing beacon (preferably two) or a light bar comprising at least two

independent light sources which are clean.

- Ideally, vehicles should be conspicuously coloured and have high visibility rear markings which are clean
- Debris should be removed from the road and path as soon as practicable, and at regular intervals, wearing high visibility clothing and before removing the hazard warning signs.
- Collect all road signs promptly when the job is complete.





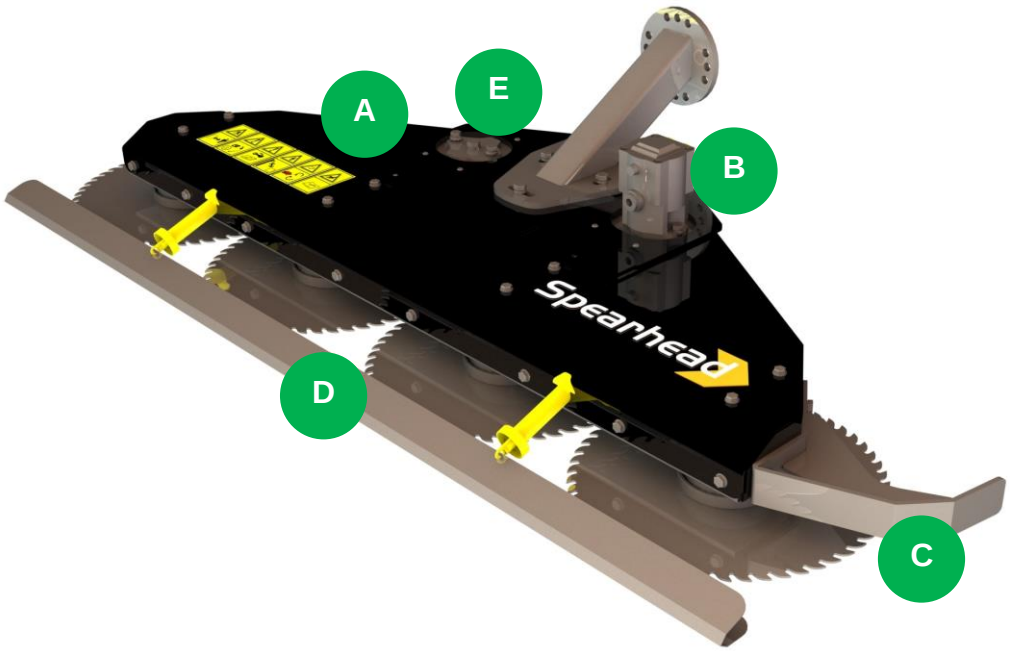
Safety Gear

It is recommended that the following personal protective equipment is worn when the operating and/or maintaining this machine; coveralls, safety boots, safety glasses, hearing protection, safety helmet, protective gloves.

Although the information stated here covers a wide range of safety subjects it is impossible to predict every eventuality that can occur under different circumstances whilst operating this machine. No advice given here can replace 'good common sense' and 'total awareness' at all times, but will go a long way towards the safe use of your Spearhead machine.

COMPONENTS IDENTIFICATION

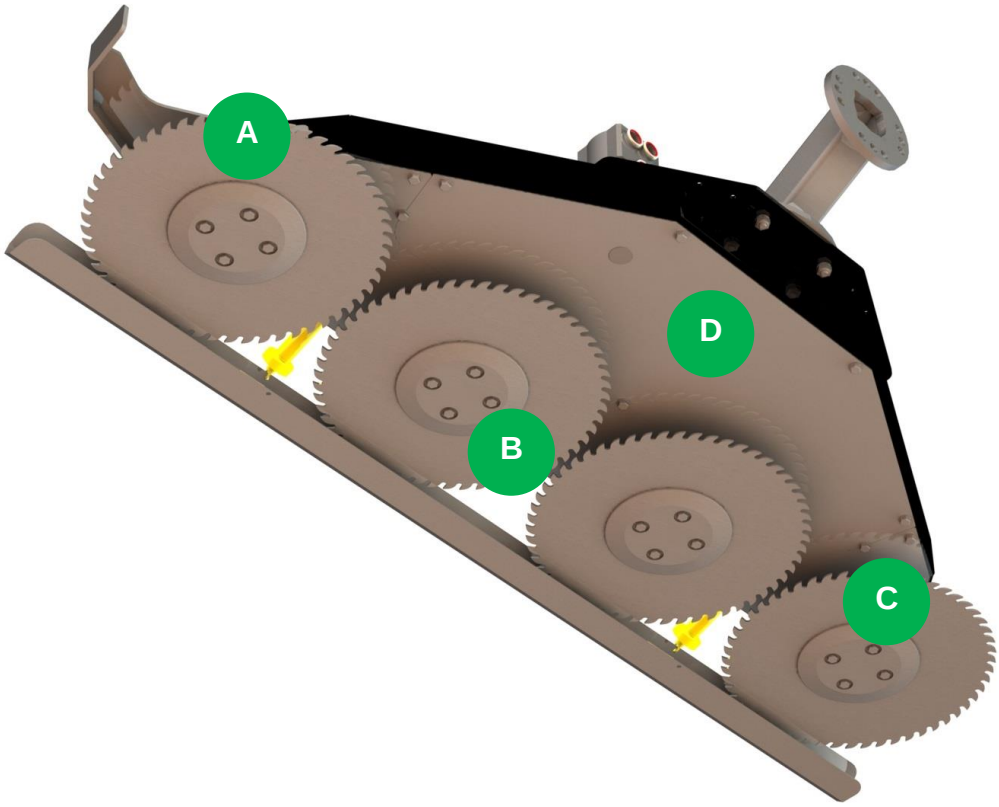
a) Main Body
b) Motor
c) Skid
d) Guard
e) LH Motor Mount Position



Please note the machine shown above is in <u>Right-hand</u> configuration. Left-hand machine builds will have item B at relocated to item E.

Blade Unit Components

a) Saw Blade
b) Mounting Plate
c) Blade Bolt
d) Cover



FEATURES

- Quadsaw for mounting on hydraulic hedge cutters.
- Frame with 4 shaft.
- Working width approximately 1.6 m (1602), 2.0m (2002) and 2.4m (2402)
- 540 RPM operating speed
- 110 kg (1602), 198 kg (2002) and 239 kg (2402) weight.
- Four blade HM precision hardened steel saw cutting system.
- Each shaft is driven by vee belts, and the whole unit is hydraulic motor driven.
- The Quadsaw is supplied with a special bracket enabling mounting on various vehicles and carriers.

SPECIFICATION

Specification/Model		1602	2002	2402
Working Width		1.6m	2.0m	2.4m
Blade Diameter		400mm	500mm	600mm
Teeth Per Blade		60	72	78
Blade Material		Hardened Steel	Hardened Steel	Hardened Steel
Blade Speed		2600-2700rpm	3000-3200rpm	2700-2800rpm
Oil Flow Rate		40 l/min	50 l/min	45 l/min
Cutting Performance	**Multiple Branch**	Up to 70mm	Up to 80mm	Up to 120mm
	Single Branch	Up to 100mm	Up to 120mm	Up to 160mm
Main Application		Vertical Cutting	Vertical Cutting	Vertical Cutting
Weight		110Kg	198kg	239kg

SAFETY AROUND THE MACHINE

Beware of the following Potential Dangers:

- Becoming trapped when hitching or unhitching.
- Tractor overbalancing when arm is extended.
- Electrocution due to hitting overhead power lines.
- Getting caught on rotating take off (PTO).
- Being hit or caught by any moving part, e.g. belts, pulleys, arms, cutting head.
- Being hit by flying debris or machine parts due to machine damage.
- Machine overbalancing when not in use.
- Injection of high pressure oil from damaged couplings or hydraulic hoses.
- Accidents due to collision with other machines, or debris left on road.

Always

- Ensure the operator has read this handbook and has been trained to use the machine.
- Ensure all cab safety guards are in place and all tractor windows closed.
- Before leaving the tractor cab always ensure the Quadsaw is firmly on the ground, no weight is on the machines' hydraulics and the rotor has stopped spinning.
- Check that all guards are properly fitted and they're not damaged or have loose parts. Particular attention should be given to the blades to ensure they are not damaged, cracked or missing.
- Inspect work area for wire, steel posts, large stones and other dangerous materials and remove before starting work.
- Beware of the danger of overhead power cables. The operator must be aware of the maximum height and reach of the machine when working under power cables. The minimum height for 11,000 and 22,000-volt cables is 5.2 metres from the ground. When fully extended, the machine may well exceed this height so extreme caution should be practised. For more information contact the Health and Safety Executive or your local power company.
- Ensure that all warning labels are always visible and that they are not damaged, defaced or missing.
- Lower the head to the ground when parking up. No weight is on the tractors hydraulics. The blades have stopped spinning, before leaving the tractor.
- Fit locking pins to slew and height before transport and before unhitching when applicable.
- Wear ear defenders if operating without a quiet cab or with cab windows open.
- Ensure tractor guards are fitted correctly and are undamaged.
- Work at a safe speed, taking into account terrain, passing vehicles and obstacles.
- Ensure that the tractor meets the minimum weight recommendations of the machine manufacturer and that ballast is used if necessary.
- Check that machine fittings and couplings are in good condition.

- Follow the manufacturer's instructions for attachment and removal of the machine from the tractor.
- Use clear warning signs to alert others to the type of machine working in the vicinity. Signs should be placed at both ends of the work site and should be in accordance with the Department of Transport recommendations.
- Ensure cutting blades are of the type recommended by the manufacturer, are securely fitted and are undamaged.
- Ensure hydraulic pipes are correctly routed to avoid damage from chafing, stretching, pinching or kinking.
- Disengage the machine, stop the engine and remove the key before leaving the tractor cab for any reason.
- Clean up any debris left at the work site.
- Ensure that when you remove the machine from the tractor it is secured in a safe position using stands provided.
- Operate the blades at a speed give under in the **Machine Specification Section**.

Never

- Never operate the machine with other people present, as it is possible for debris, including stones, to be discharged from the front and rear of the head. WARNING: Some cutting heads may continue to 'freewheel' for up to 20 seconds or more after being stopped.
- Never operate the machine until you have read and understood the relevant handbook and are familiar with the controls.
- Never use a machine that is poorly maintained or has guards damaged or missing.
- Never allow an inexperienced person to operate the machine without supervision.
- Never use or fit a machine onto a tractor if it doesn't meet manufacturer specification.
- Never use a machine if the hydraulic system shows signs of damage.
- Never allow children to play on or around the machine at any time.
- Never attempt any maintenance or adjustment without first disengaging the PTO, lowering the head to the ground, stopping the tractor engine and applying the tractor parking brake.
- Never leave the cab without removing the ignition key.
- Never operate the tractor or controls from any position than the driving seat.
- Never stop the engine with the PTO engaged.
- Never operate with the sawblades missing.
- Never operate PTO **above** recommended speed, 540 RPM.
- Never operate with wire around any rotor. Stop immediately.
- Never use the head at any angle, which may throw debris towards the cab.
- Never attempt to use the machine for any purpose which it wasn't designed for.
- Never transport with PTO engaged.
- Never enter the working area of the machine (risk of injury!).

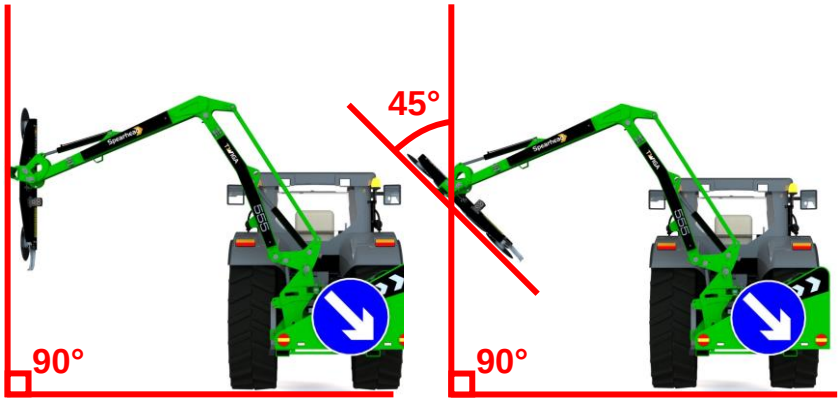
- Never transport with the controls live, always turn off the isolator switch (red) and disconnect supply.
- Transport the machine without the blade protection guards mounted.
- Attempt to detect a hydraulic leak with your hand; use a piece of card.
- Exceed maximum oil pressure of 250 bar in the hydraulic hoses.

BEFORE STARTING WORK:

Description of the Quadsaw Branch & Tree Cutter:

Hydraulic driven tree and branch cutter.
The tool is used for the cutting of trees and branches that have a maximum diameter of 70, 80 or 120mm depending on the particular model. The machine consists of a self-supporting shield with four shafts for mounting rotors with HM precision hardened steel saw blades. Each shaft is driven by ridged vee-belts and the overall working is through the hydraulic driven vehicle. A skid is located on one end of the machine (depending on whether LH/RH version). The belt drive is protected by a steel cover. Gaining access to the belt drive for maintenance purposes requires loosening bolts.

Setting Up For Work:



- Wear safety glasses and work gloves.
- Remove the blade safeguard if fitted and turn the armsystem into work position.
- Start the tool at low oil flow (low rpm). Let the tool warm up for a few minutes.
- Adjust machine between a **maximum of 45° to vertical or complete vertical** for cutting and raise into work position.
- Adjust the rotor rotations to the recommended speed and drive with a safe speed that is adjusted to the terrain and other possible obstacles.

Tool Start:

- Choose low engine RPM.
- Make sure that the surrounding area is secured.
- **Warm start –** start the tool.
- **Cold start –** never start the tool at maximum speed. Let the tool run without much strain for approximately 15 minutes to heat up the oil.
- Slowly increase rpm until the correct oil amount is reached.
- Never attempt to restart a strained/wedged in tool. Stop the tool and the vehicle engine. Remove the ignition key and engage the handbrake. Only then it is safe to remove the wedged in material. Always wear safety glasses and work gloves.

Tool Stop:

- Reduce engine RPM to fast idling and stop the tool.
- Never increase or reduce the oil amount too fast. This will damage the hydraulic system on a long-term basis.
- When you are finished working, stop the engine, remove the ignition key and engage the handbrake. Always wear safety glasses and work gloves. Refit safeguard. Beware of sharp cutting parts!

- Always show consideration for other road users during transportation.

Power Lines:

- Always pay close attention to overhead lines. Between power poles there is always risk of hitting overhead lines. When in doubt please contact your local power station for advice concerning safety distance.

MOUNTING/DISMOUNTING THE MACHINE:

- The blades MUST be mounted in a downward cut rotation. Mount the blades so they are cutting down (muse run the same way as the tractor). Bolts are to be tightened to 40.1 Nm with 10.9 grade bolts.
- Mount the Quadsaw so the blades are in the driving direction.
- Mount the hydraulic hoses so the blades are running in the correct direction.
- The Drainage hose (max 1.5 bar) must be led directly to the oil reservoir.
- The Return hose (max 15 bar) must also be led directly to the oil reservoir.
- Check the system for oil leaks.
- When the machine is used for the first time, measure the blade RPM speed and check against the MACHINE SPECIFICATION, when operating in 540RPM PTO speed.
- Maintaining this speed is important for the best optimum performance from your Spearhead Quadsaw.

Mounting tool must be done at a plane and safe surface. Always pay close attention when mounting the tool to the machine; make sure that no persons are within range of the sawblades, as these can cause injuries even when stationary. For safety reasons the sawblades must be always be fitted with the safety guard when not in use, and this should only be removed when starting the work. Always wear work gloves when working with the machine.

Never use the tool on an unstable or non-suitable vehicle.

Mounting to an arm system or similar:
Tools can be mounted to the arm system with a Quickhitch or with bolts. Spearheads' Quadsaw are designed specifically for Spearhead's various reach arm machines and Spearhead's HXF. Quadsaws' are designed to be mounted on tractors via a suitable armsystem. The 1602 has a work width of approximately 160cm with a weight of 110kg, the 2002 has a work width of approximately 200cm with a weight of 198kg and the 2402 has a work width of approximately 240cm with a weight of 239kg. If necessary, ballast can be mounted on the vehicle or the reach arm to ensure stability and balance during any work or working conditions.

Never use the machine with broken or missing sawblades.

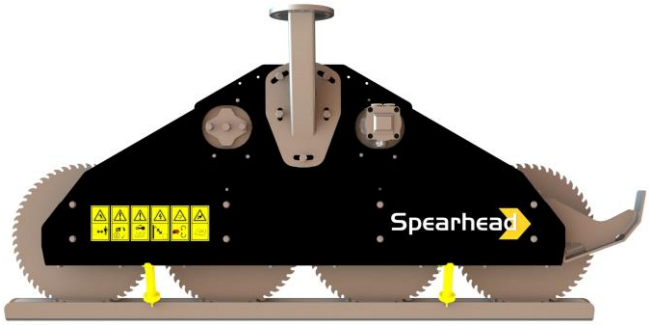
WARNING

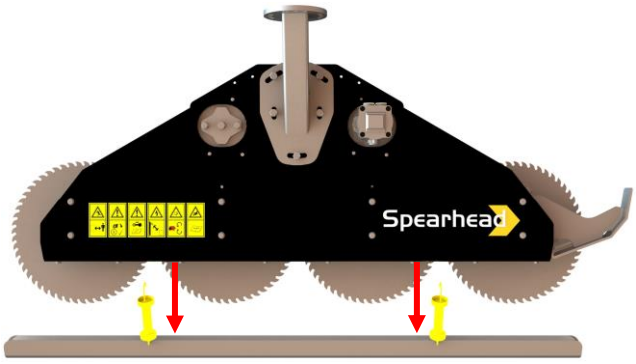
Be careful with rotating blades. Danger of cuts! Danger of getting caught!

DANGER

The tool must never be operated without the rubber curtain.

Removing The Guard



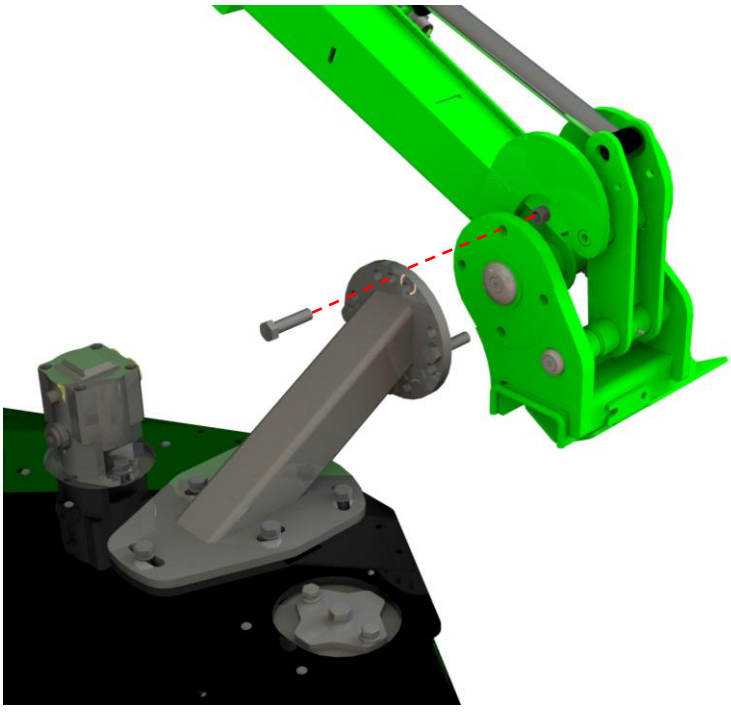


Un-hook the spring and remove the guard

Aligning & Tightening

To mount the Quadsaw to the Spearhead Twiga reach arm, lower the arm in order to align the faces between the machines.

Bring the faces together and then insert the four M16 bolts and Nylock nuts and tighten to the required 214Nm (158 ft. lb.).



HOSE CONNECTIONS

DRAIN – Smallest Hose (Marked Blue)

- Connected to a depressurized (0 bar) tank connection.
- THIS MUST **NEVER BE CONNECTED TO RETURN**

PRESSURE – Medium Sized Hose (Marked Red)

- Connected to Pressure (P), with a maximum of 200 bar.

RETURN – Largest Sized Hose (Marked Green)

- Connected to Tank (T), with a maximum back pressure of 15 bar.

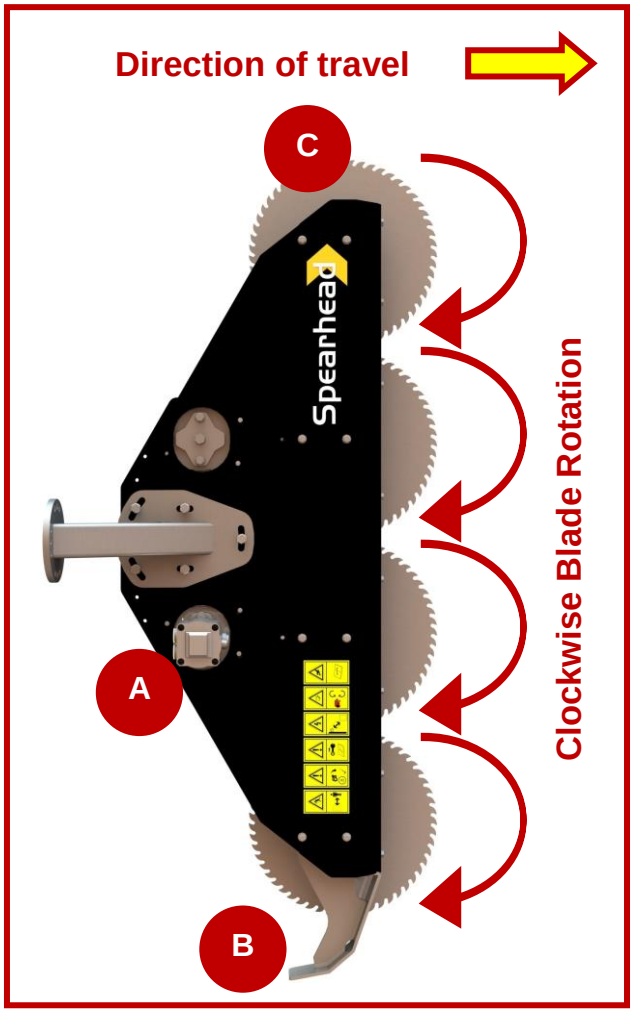
OBS: Case drain pressure may never exceed return pressure.

All machines supplied by Spearhead have hose connections with the following stickers:

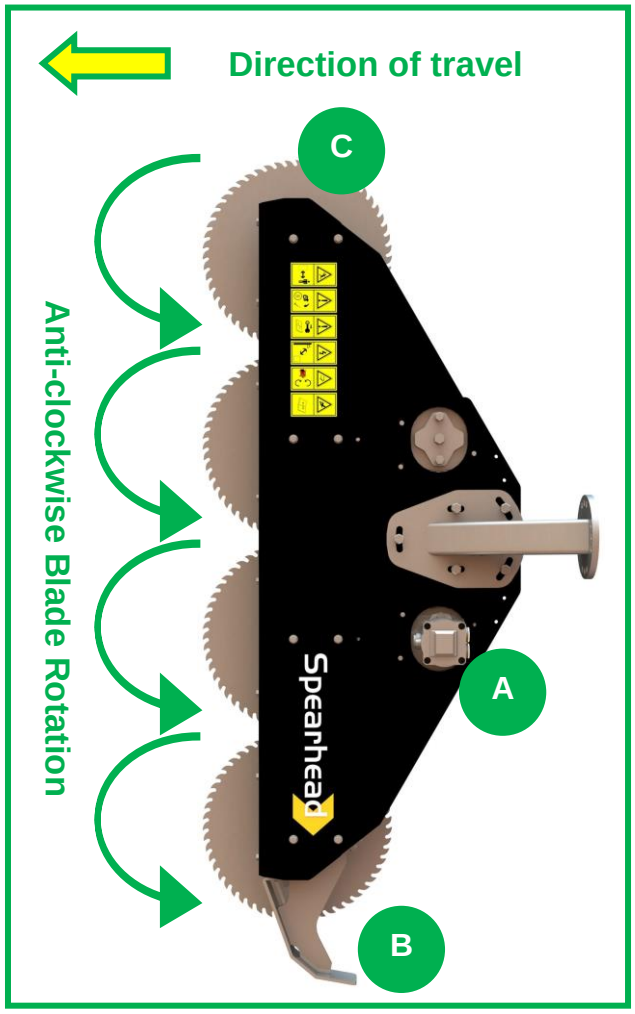
BLADE CUTTING DIRECTION

Depending on whether your machine if Left hand (LH) or Right hand (RH) build influences:

a) The location of the gearbox
b) The location of the skid
c) The orientation of the blades



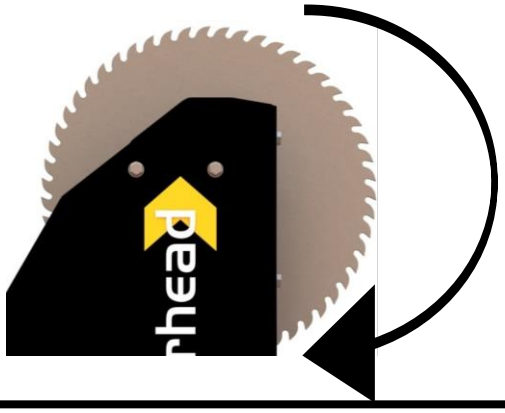
LH Mounted Machines
(Viewed from operating position)



RH Mounted Machines
(Viewed from operating position)

WARNING

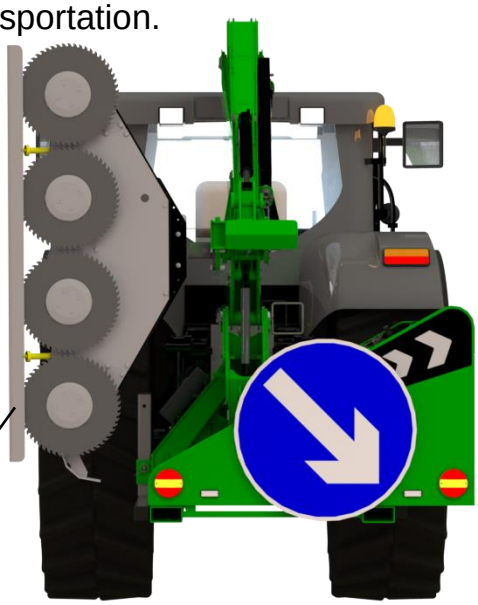
Blades must be mounted to cut in a **<u>downward direction only</u>**.



- The blades MUST be mounted in a downward cut rotation. Mount the blades so they are cutting down (must run the same way as the tractor).
- Blade bolts (10.9 grade); need to be torqued to 40.1 Nm.
- Mount the Quadsaw so the blades are running in the driving direction.
- Mount the hydraulic hoses so the blades are running in the correct direction
- Then mount the hydraulic hoses as described in the “Hose Connections” section.

TRANSPORTING THE QUADSAW

- After finishing work, the arm with the attached Quadsaw is to be pulled close to the vehicle.
- The Quadsaw needs to be positioned where it takes up the least room.
- The inner arm is lifted until the transportation stop is met or close to the vehicle.
- Transport safety locked is mounted (if supplied).
- For Spearhead machines with slewing ability the reach arm should be slewed behind the tractor. Be mindful, if the reach arm is lifted to the transportation stop that it doesn't hit the cab of the vehicle or will hit the cab during transportation.
- The Quadsaw and reach arm are now ready for transportation.



REMEMBER to fit the blade protection guard before transporting the Quadsaw.

BEWARE of the reach arm clashing with vehicle when the reach arm is slewed.

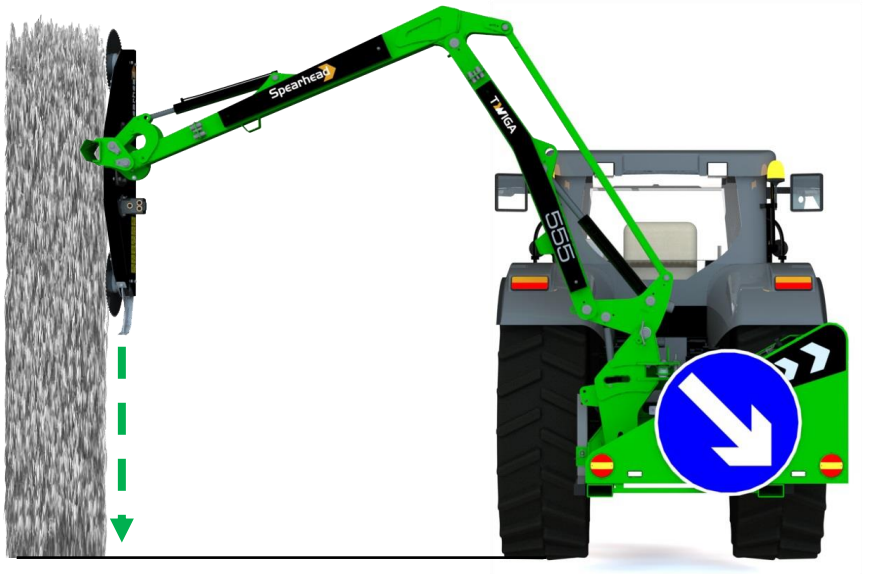
NOTICE

The machine shown above is of a LH (Left-hand) build Spearhead Twiga. For RH (right-hand) builds the folded reach arm needs to be a mirror of what is shown above.

WORK POSITION WITH THE QUADSAW

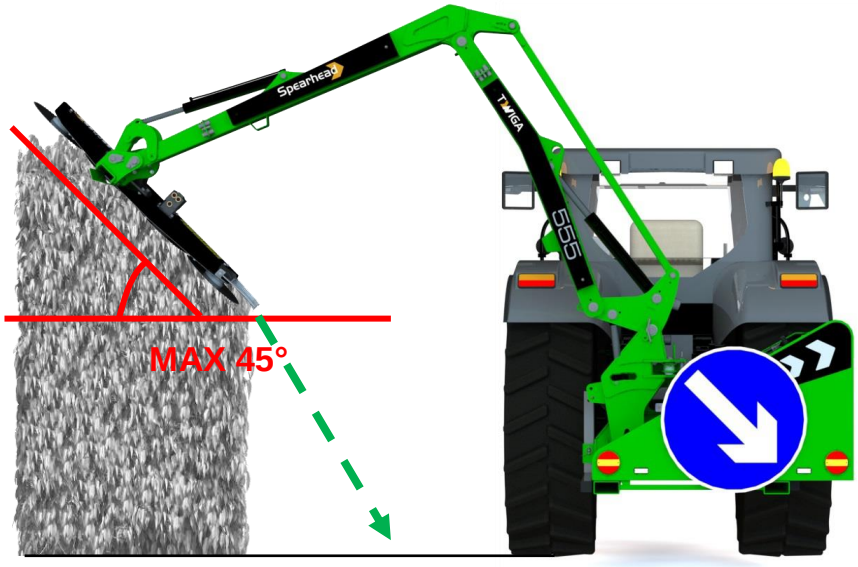
1. Turn the arm into work position.

2. The Quadsaw is designed to work vertically. When cutting hedges always start from the bottom vertically.

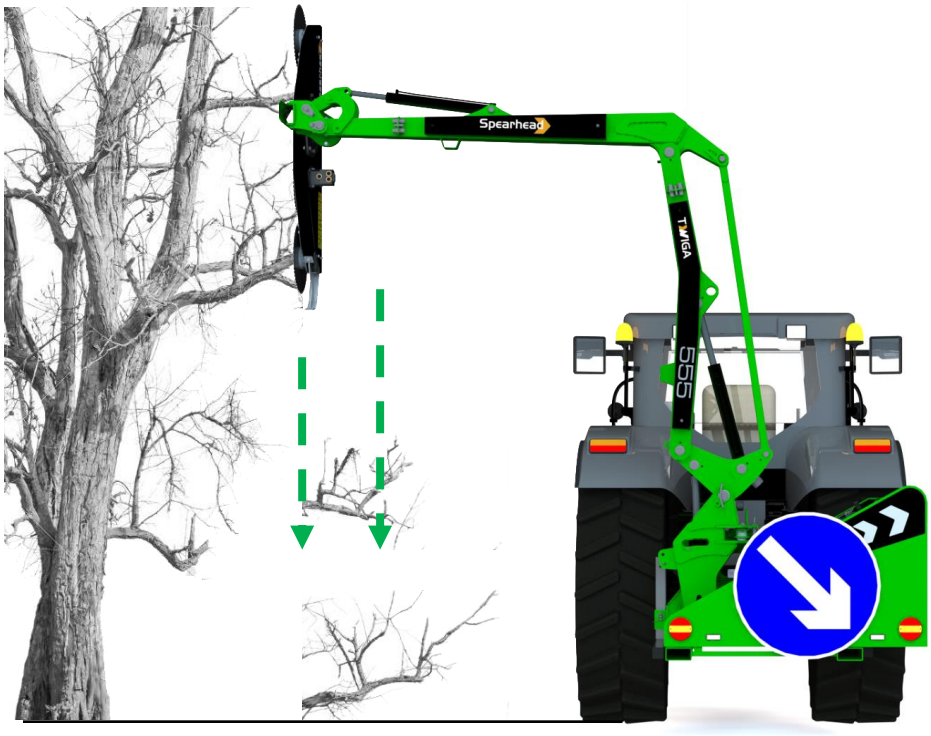


3. The Quadsaw is designed to work vertically but can be angled to work at a **<u>maximum angle of 45°.</u>**

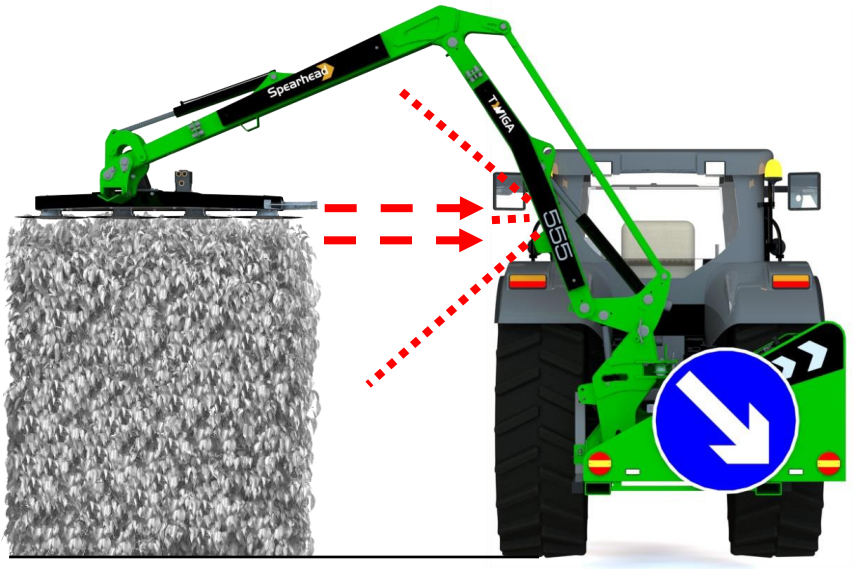
   The position should be considered in order to make sure **debris doesn't hit the tractor**.



4. When working on trees ensure that the tractor is of suitable distance from the tree to ensure the safety of you and the tractor from falling, cut branches.

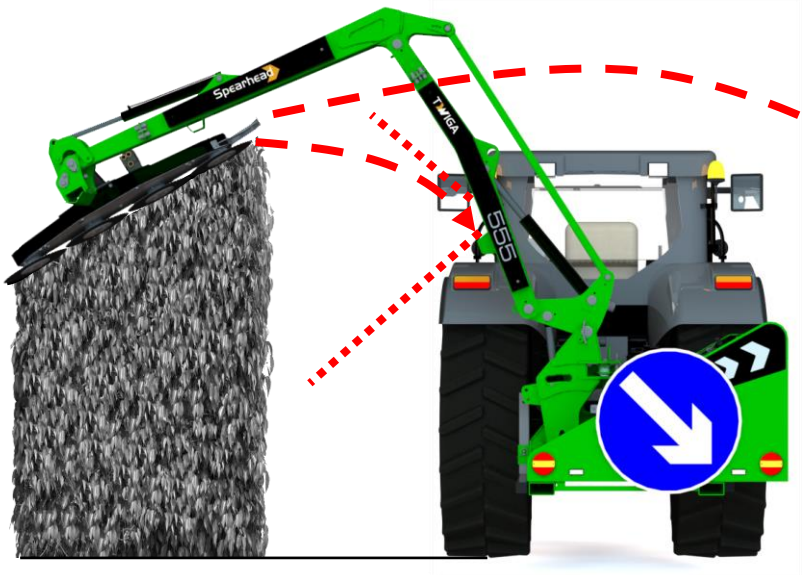


5. The Quadsaw should **NEVER cut horizontally**. Debris and items will get thrown towards the tractor.

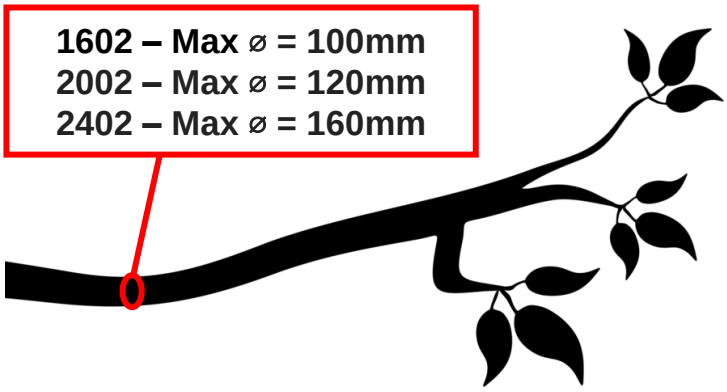


6. The Quadsaw should **NEVER** be used to cut grass.

7. The Quadsaw should **NEVER** be used at angles which could cause debris to get thrown towards the tractor or other bystanders, vehicles or buildings.



FIELD OF APPLICATION



The Quadsaw is used for cutting multiple branches and trees up to a maximum diameter of 70mm (1602), 80mm (2002) and 120mm (2402). Individual Branches which are larger than this but less than 100mm (1602), 120mm (2002) and 160mm (2402) must be cut one at a time. Any greater sizes than these values are not able to be cut with your particular Quadsaw.

Vertical cutting is allowed up to a 45° angle. **Horizontal cutting should not be carried out with the machine.**

OBS: the saw must be frequently emptied of material.

It is recommended that forward speed is kept to a minimum when starting work in order to obtain the correct working speed of the blades. Set the angle of the Quadsaw so it is positioned at right angles to the work and adjust the machine position so the branches meet the saw blades ‘straight on’.

Wherever possible try to keep the blades running vertical in relation to the direction of travel, this will help prevent them from ‘distorting’ during operations.

Should small branches, debris or unwanted material get stuck in the blades **the machine and tractor must be switched off** and the starting key removed before attempting to clear the blockage. If necessary, remove the belt cover to gain better access to the blockage; replace cover immediately before starting or using the machine.

Any other use than the one described is against the intended use. Spearhead Machinery is not liable for damages as a result of this; the risk lies solely on the user.

WARNING

Never run the machine without belt cover mounted.

WARNING

Great care must be taken when attempting to clear debris from the blade and/or belt area of the machine; sharp components and numerous pinch risk points exist in these locations. Safety gloves and safety eyewear should be worn and wherever possible the use of a suitable tool should be used to remove any debris to ensure hands and fingers are kept clear of any risk areas.

DANGER

Never use the machine as a stationary saw for making firewood.

DANGER

Never use the machine as a crane.

Inadmissible Working:

The operational reliability of the delivered machine can only be guaranteed if it is used according to the intended use as described in this manual. The limit value stated in the data sheets must under no circumstances be exceeded.

The machine is not suited for cutting grass or horizontal cutting. The machine must never be used for cutting the “back side” of a hedge, so that the rotating blades are facing the user.

When in charge of the machine **ALWAYS** obey the following rules:

- Inspect the work area prior to operation and remove any dangerous material.
- Never operate the machine with persons or animals in close proximity.
- Ensure all cab guarding is in place and the tractor windows are kept shut.
- Only operate the machine at the correct blade speed.
- Never transport the machine without the blade protection guards fitted.
- Never approach the machine when it is running, always switch it off and stop the tractor.
- Always remove the vehicle ignition key before leaving cab.
- Never use the machine to perform tasks it was not designed for.
- Always lower the machine to rest on the ground with blade protection guards fitted when the unit is parked up or not in use.

DRIVING DIRECTIONS FOR USING THE QUADSAW

Always star and stop the tool at the lowest PTO RPM/Oil Flow

Choose a suitable forward drive depending on the hedge, surface, traffic and visibility.

It is recommended to travel at a slow forward speed when starting work in order to obtain and keep the recommended RPM of the blades. Adjust the angle of the saw to approximately 90° in relation to the branches. If a thick branch is approaching the branch reflectors, the working height must be adjusted for the branch to hit the saw blades straight on.

If small branches or other unwanted material gets stuck in the blades, the machine must be stopped and cleaned.

Always ensure that the blades are running vertical related to the direction of travel. This will prevent the blades from bending too much.

NOTICE

Use the advantage of the skid found at the bottom of the Quadsaw to prevent the saw blades from hitting the ground.

NOTICE

The cutting angle is as std. a “top link”, and can only be adjusted when the machine is stopped.

NOTICE

If fitted to a Spearhead HXF carrier frame a hydraulically operated ram (an option) can be mounted. Operate the ram in the required direction to set the desired cutting angle before starting work. The ram may be operated during work to make minor angling adjustments, but is recommended to stop work before making major adjustments to the cutting angle.

DANGER

If the sawblades in any way block then stop the saw, stop the carrier, take out the ignition key, pull the handbrake, take your safety goggles and gloves and remove the jammed piece of wood. If possible use a tool in order to remove the blockage, rather than using your hands.

FIRST TIME OPERATION

- Gently lift the machine.
- Operate for 5 minutes to begin with.
- Check all collections for oil leaks.
- First time the machine is used, measure to ensure the correct blade speed.
    - **Quadsaw 1602** = 2600 – 2700 rpm
    - **Quadsaw 2002** = 3000 – 3200 rpm
    - **Quadsaw 2402** = 2700 – 2800 rpm

Maintaining the correct speed for machine is important for optimum performance.

WARNING

Never use the machine with broken or missing sawblades.

WARNING

Blades must be mounted in a downward cutting rotation only.

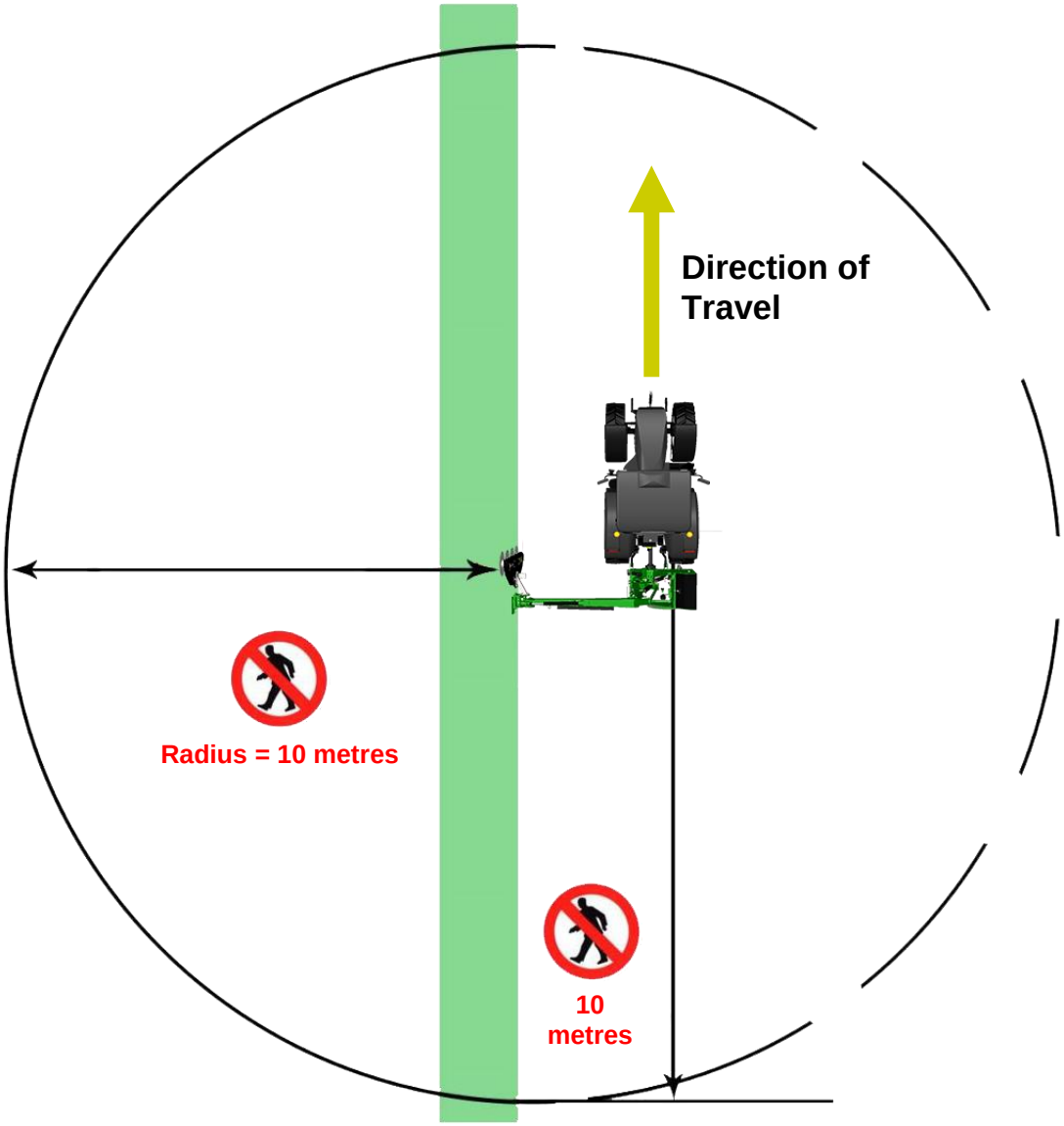
WARNING

Attachment of the machine must be performed in a safe location on a firm level site. Care should be adopted at all times when handling or manoeuvring the machine during the attachment procedure; ensure all persons remain clear of the cutting blades which possess the potential to cause injury even when stationary. For reasons of safety the blade guard should be fitted to the machine at all times and only removed for machine operation.

DANGER

Never use the machine on a vehicle that is unstable or unsuitable.

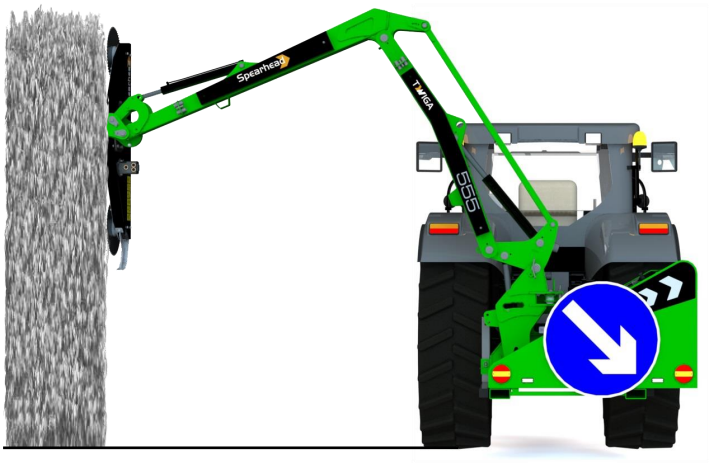
SAFETY DISTANCES VERTICALLY:



Safety zone at 1 metre cutting height vertically

Cutting Height Vertically	Safety Radius	Safety Distance From The Front
0 – 1m	5 m	10 m
1.1 – 1.2 m	6 m	11 m
1.2 – 1.3 m	7 m	12 m
1.3 – 1.4 m	8 m	13 m
1.4 – 1.5 m	9 m	14 m
> 1.5 m	10 m	15 m

OPERATING THE MACHINE



It is recommended that forward speed is kept to a minimum when starting work in order to retain the correct working speed of the blades. Set the angle of the Quadsaw so it is positioned at right angles to the work and adjust the machine position so the branches meet the saw blades ‘straight on.’

Wherever possible try to keep the blades running vertical in relation to the direction of travel (the Quadsaw can be angled to 45° maximum and no more), this will help prevent them from ‘distorting’ during operations.

The skid mounted on the bottom of the base of the machine is used to prevent the blades from hitting the ground. Note how it’s mounted depending on whether the machine is LH (left-hand) or RH (right-hand) build.

Should small branches, debris or unwanted material get stuck in the blades, the **machine and tractor must be switched off** and the starting key removed before attempting to clear the blockage. If necessary, remove the belt cover to gain better access to the blockage; replace cover immediately before starting or using the machine.

WARNING

Never attempt to run the machine with the belt cover removed.

WARNING

Great care must be taken when attempting to clear debris from the sawblade and/or belt area of the machine; sharp components and numerous pinch points exist in these locations. Safety gloves and safety eyewear should be worn and wherever possible a suitable tool should be used to remove any debris to ensure hands and fingers are kept clear of any risk areas.

When in charge of the machine always obey the following rules:

- Always inspect the work area prior to operation and remove any dangerous materials.
- Never operate the machine with persons or animals in close proximity.
- Ensure all cab guarding is in place and the tractor windows are kept shut.
- Only operate the machine at the correct blade speed.
- Never use the machine in excess of the maximum oil pressure in the hoses (250 bar).
- Never stop the engine with the PTO engaged.
- Never transport the machine with the PTO engaged.
- Never transport the machine without the blade protection guards fitted.
- Never approach the machine when it is running, always switch it off and stop the tractor.
- Always remove the tractor ignition key before leaving the cab.
- Never use the machine to perform tasks it was not designed for.
- Always lower the machine to the rest on the ground with blade protection guards fitted when the unit is parked up or not in use.

MAINTENANCE

The Quadsaw must only be used, maintained and serviced by authorized and educated personnel. Area of responsibility, qualifications and supervision of personnel must be carefully regulated by the head of operations. If personnel do not meet these terms they must be trained and instructed.

Head of operations must also make sure that the content of the manual is understood and implemented.

Maintenance procedures not mentioned in this manual must only be carried out by authorized repair shops.

Bypassing the safety advice in this manual may result in endangering persons, the environment and/or the tool.

Bypassing the safety advice may result in all compensations claim being repealed.

To be exact bypassing the safety advice may result in:

- Endangering persons at non-secured work areas!
- Malfunction of important machine functions!
- Malfunction of prescribed methods for maintenance and service!
- Endangering persons following mechanical or chemical impact!
- Endangering the environment following a hydraulic oil leak!

Only carry out service with machine shut off. The procedure for stopping the machine as described in Spearhead's manual must be followed.

When carrying out maintenance on a lifted head and/or machine, secure with suitable support elements.

When changing heads with blades, always check the hydraulic system for remaining pressure. If present reduce to zero.

Only use suitable tools and wear work gloves, safety shoes and safety glasses.

Dispose of oil and grease according to regulations.

Directly after finishing work, all safety and protection mechanisms must be remounted and reactivated.

Beware of blades and belt areas when maintaining and servicing.

Initial Maintenance

- After an initial 2 hours work, re-tighten taper-lock bushes to 40.1 Nm (29.5 lb ft.).
- After 10 hours work all bolts, screw and Taper-lock bushes must be retightened. If the bushes loosen at a later time they may be secured with Loctite.
- Dismount the belt guard to clean the housing.
- Inspect and if necessary adjust the belts. (see Belt Diagram)
- Spearhead Machinery recommend changing all sawblade axles after 1500 hours of work, as of the possibility of metal fatigue.

Spearhead Machinery recommend changing all sawblade axles after 1500 hours of work, as of the possibility of metal fatigue.

Regular Maintenance

- Check all bolts and screws every 8 hours and re-tighten when required.
- Branch deflectors must be adjusted as close as possible to the blades without touching them.
- Remove the belt guard and clean the housing.
- Inspect the belts and check their tension, adjust them if required.
- Check the condition of the protection guards – always the replace guards' before using the machine.

ROUTINE MAINTENANCE SCHEDULE

Regular Maintenance
Regular maintenance carried out at the intervals specified in the maintenance chart below will ensure that the machine operates correctly and safely and minimise operational down time. See the following page for maintenance safety before attempting to work on the machine.

After 1 hour of Use (New Machine)

- Check motor mounting bolts for tightness – tighten if required.
- Check mounting bolts on saw blade mounting plate(s) – tighten if required.
- Check headstock mounting bolts for tightness – tighten if required.

After 10 hours of Use (New Machine)

- Check motor oil level(S) – top up if required.
- Check saw blades for damage.
- Check headstock mounting bolts for tightness – tighten if required.

MACHINE COMPONENT	MAINTENANCE INTERVAL			
	Weekly	**Fortnightly**	**Monthly**	**Annually**
Motor				
Check mounting bolts – tighten if required	✓			✓
Check oil level – top up if required		✓		✓
Replace oil – drain and refill				✓
Saw Blade Mounting Plates				
Check mounting bolts – tighten if required	✓			✓
Saw Blades				
Check for damage or wear	✓			✓
Fasteners				
Check tightness and condition of fasteners and fittings			✓	✓

LUBRICATION

Grease the lubrication points on machine on the following basis:

- Daily prior to use.
- Always prior to storage.
- Always after it has been washed.

NOTICE

Never use grease that contains Molybdenum Disulfide on Nylon bushes.

Hydraulic Hoses

CAUTION

Carefully check the condition of all hoses during routine service paying particular attention to chafed outer casing.

NOTICE

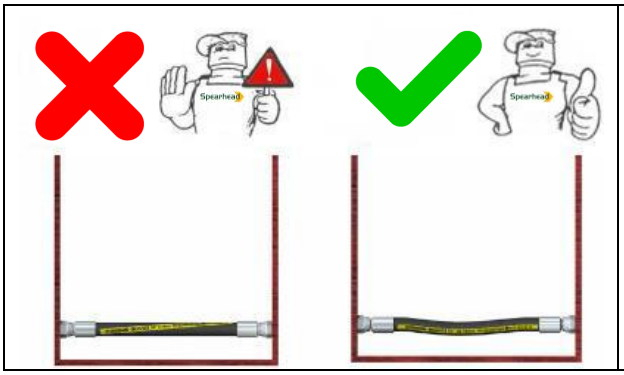
Daily inspect all hydraulic hoses and fittings to be in good order. Any damages or leaks must be rectified immediately; this is part of the daily maintenance and is your responsibility to ensure a long reliable working life.

DANGER

Spearhead's hydraulic system works at very high pressure. When replacing hoses, use only genuine hoses. A burst hose could be very dangerous!

NOTICE

When replacing hoses avoid twisting fitting, use two spanners to slacken and tighten.



Warning!

Hoses are weakened when installed in a twisted position. Also, pressure pulses in a twisted hose tend to fatigue wire and loosen fitting connections. Aim so that the machine produces bending rather than torsion.

All hose connections are of a 'soft seal' type and should be turned to the torque settings shown below in order to be leak proof.

Torque Settings For Hydraulic Hoses

BSP (size)	Nm
¼"	25
3/8"	40
½"	60
¾"	115
1"	140

Check daily for all hydraulic connections and fittings to see they are in good condition. Any defect or leak must be immediately repaired, it is part of the daily maintenance that will reduce costs and prolong machine life.

If fittings require tightening use 2 spanners and avoid overtightening. If the fitting continues to leak; replace it.

Please Read The Following Advice Carefully!

Always check the black protective sleeve is in good order. To replace the sleeve is far cheaper than replacing expensive hoses.

Hose warranty is limited to the replacement of hoses due to faulty materials or manufacture. Warranty will not be considered on: hoses damaged by chafing, abrasion, cuts or pinching while in work, or to damaged threads due to overtightening.

Oil Supply

- Daily, check the oil level in tank reservoir before starting up.
- It is good practice to constantly keep an eye on the tank level gauge, (this can be seen from the tractor seat) as a pipe burst could empty the tank within minutes.
- A pump or motor starved of oil will be damaged beyond repair.
- Replace oil if signs of contamination occur (discolouration).
- Use the correct and suitable hydraulic oil
- Contamination can be reduced by:
  - *Thoroughly cleaning around reservoir cap before removing*
  - *Using a clean container when replenishing the system*
  - *Regularly servicing the filtration system*
  - *Never allowing the oil level to fall below the sight gauge*

Regular Maintenance Tasks On The Lubrication System

After every 4 hours of use the following maintenance tasks should be placed on the machine:

- Check bolts for tightness and retighten if required.
- Check valve block, hoses and fittings for signs of leaks – retighten or replace seals if required.
- Bolts and bushes should be greased and retightened.

WARNING!
The recommended oil flow has been informed by the manufacturer. Never exceed this.

Lubricating Oil Precautions

Avoid excessive skin contact with used oil. Used oil contains potentially harmful contaminants which may cause skin cancer or other serious skin disorders. Avoid excessive skin contact with used lubricating oils and always adhere to the health protection precautions.

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Avoid contaminating clothes with oil (particularly those next to the skin). Overalls must be cleaned regularly. Discard heavily soiled clothing or oil impregnated footwear.
- First aid treatment should be obtained immediately for open cuts and wound
- Apply barrier creams before each work period, to help lubricating oil from contaminating the skin.
- Use moisturisers after cleaning; preparations containing lanolin help replace the skin’s natural oils which have been removed.
- If skin disorders develop, obtain medical advice without delay.
- Wear eye protection (e.g. goggles or a face shield) if there is risk of eye contamination. Eye wash facilities should be provided in close vicinity of the work area.

BELTS

WARNING

Great care must be adopted when servicing the machine as there is risk of trapping hands or fingers in the belts, pulleys or sawblades.

- It is of upmost importance that the belts are correctly mounted and tightened. Where new belts are mounted they must be tensioned to 900 Nm (1602), 950 Nm (2002) and 1100 Nm (2402).
- After 3-5 working hours the belts may have slackened and must be checked.

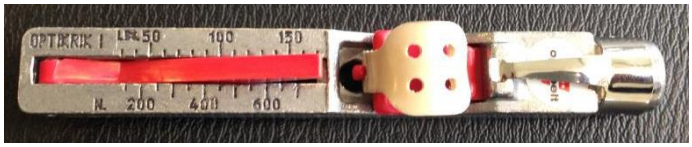
CAUTION

They must now be tensioned to:

- **1602 – 650 Nm**
- **2002 – 720 Nm**
- **2402 – 900 Nm**

Checking Tension

- Take the lid off.
- Check the Nm setting with tool 200155.0
- Adjust power belts if required.
- Re-check again with tool 200155.0
- Remount the lid.

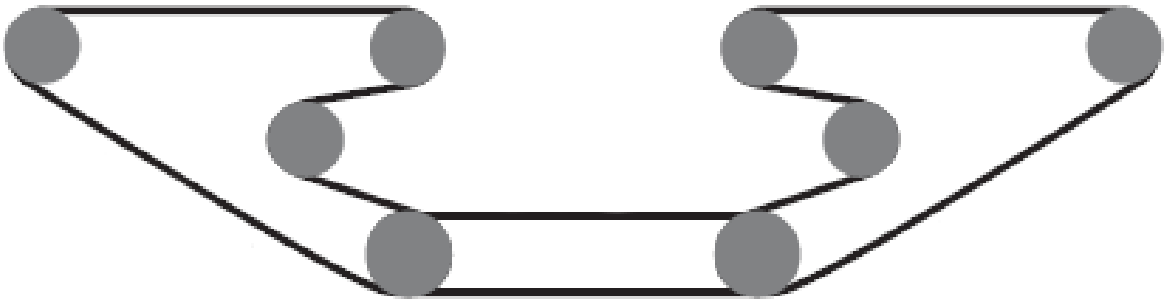


Tools For Checking Belt Tension
OPTIKRIK II
Part No. 200155.01

Contact Spearhead Machinery if you have any questions. We might help you with a piece of good advice.

NOTICE

See “Belt Diagram” for the correct orientation of belts for your particular machine.



CORRECT BELT TENSION

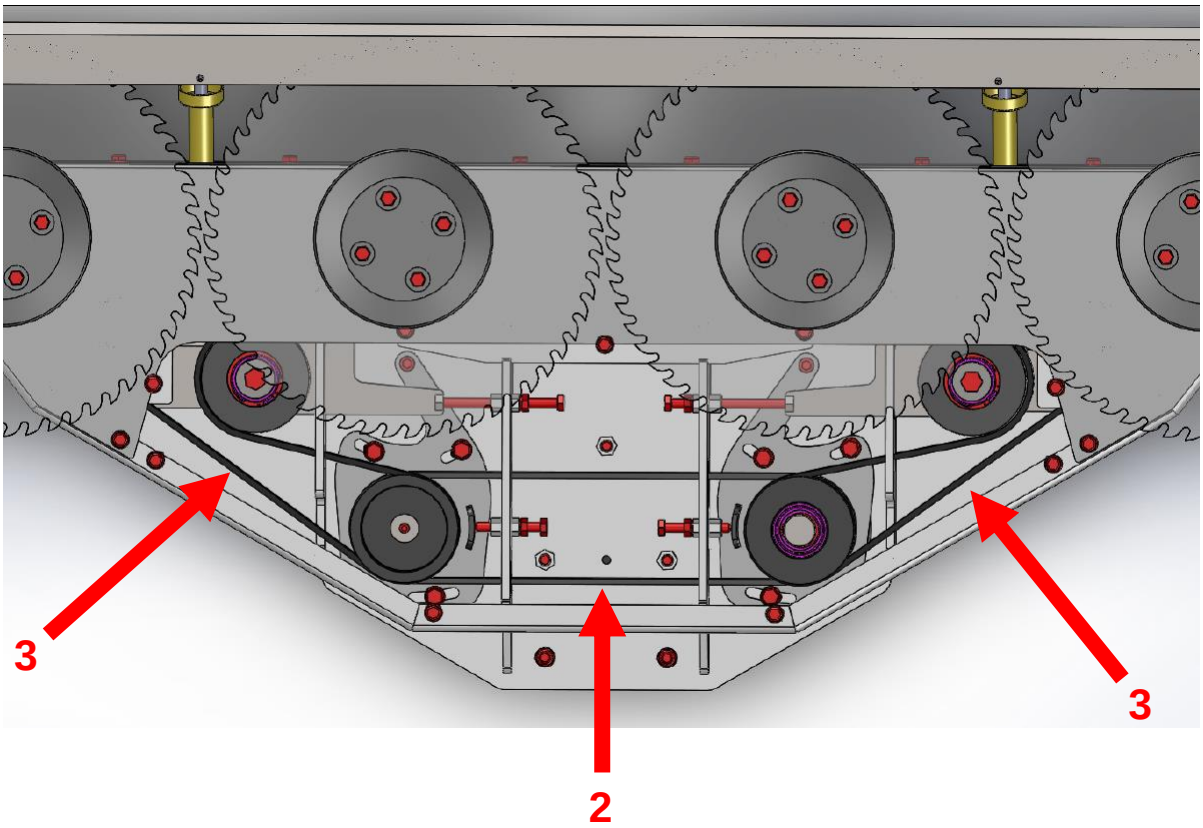
See “Belts” section for further information.

NOTICE

After adjustment the blades must be turned a few times and checked again.

Recommended Tools

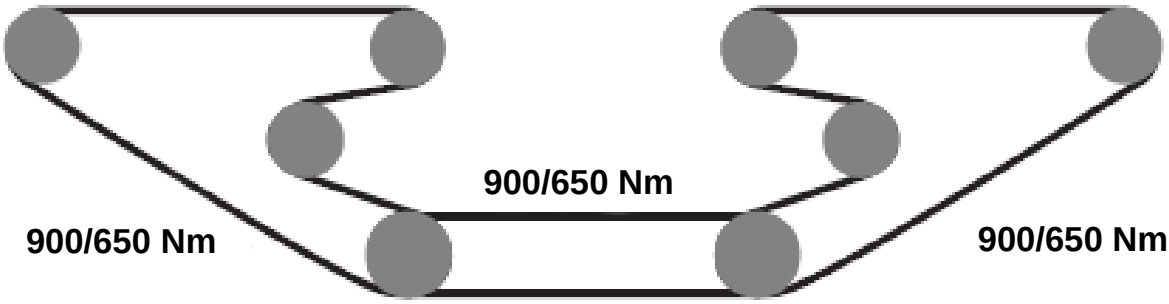
- Belt Tensioner “Optikrik II”
- 19 mm socket
- Socket extension bar
- Ratchet
- 17 mm and 19 mm spanner
- Gloves



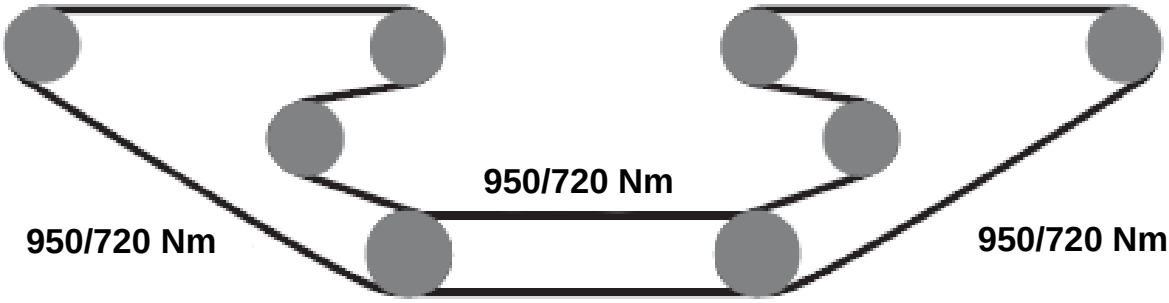
1. Take the lid off, mounted behind the saw blades.
2. Check/adjust the short belt by the engine.
3. Check/adjust the 2 long belts connected to the saw blades.
4. Measure the belt tension on the middle of the belts (shown by **Red Arrows**)
5. Remount the lid

BELT DIAGRAMS

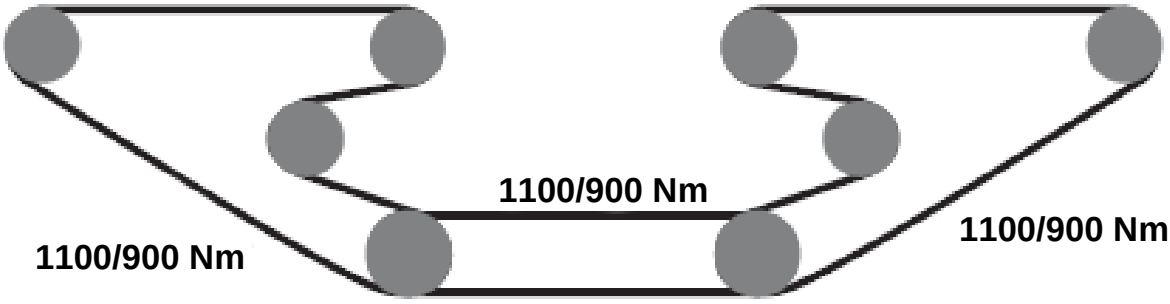
LRS 1602



LRS 2002



LRS 2402



Tool For Checking Belt Tension
OPTIKRIK II
Part No: 200155.0

HOSE CONNECTIONS

DRAIN – Smallest Hose (Marked Blue)

- Connected to a depressurized (0 bar) tank connection.
- THIS MUST **NEVER BE CONNECTED TO RETURN**

PRESSURE – Medium Sized Hose (Marked Red)

- Connected to Pressure (P), with a maximum of 200 bar.

RETURN – Largest Sized Hose (Marked Green)

- Connected to Tank (T), with a maximum back pressure of 15 bar.

OBS: Case drain pressure may never exceed return pressure.

All machines supplied by Spearhead have hose connections with the following stickers:

PUMP AND MOTOR FAILURE

There can be many reasons for pump and motor failure, cavitation, too high pressure and pollution.

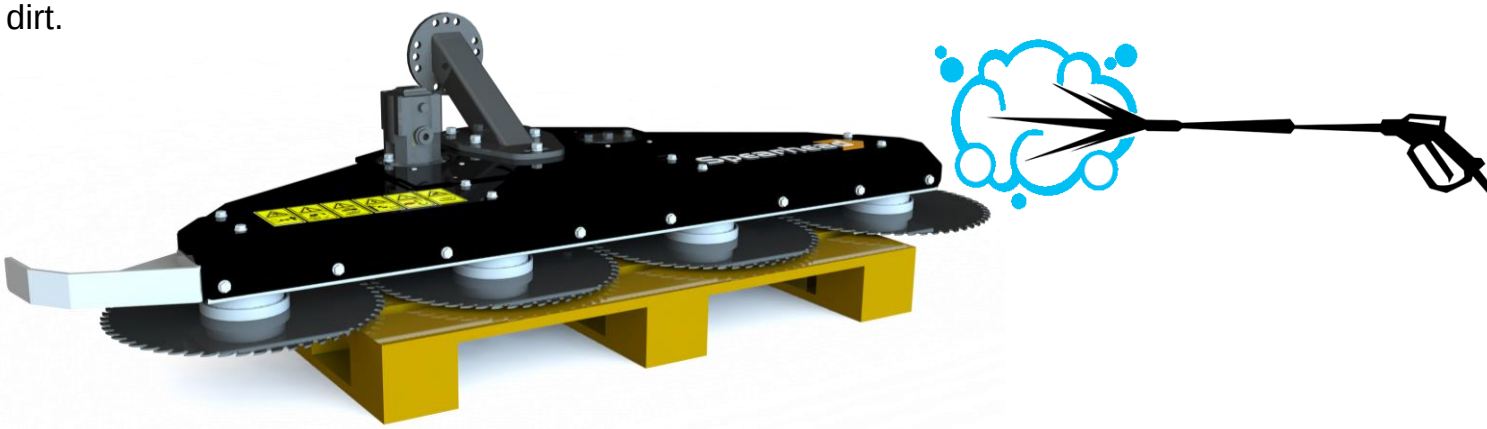
Precautions to prevent a change of motor failure:

- Never run out of oil.
- Never let a cold reach arm machine run up in speed too quickly. The reach arms gearbox and oil must warm up by running at idle before the Quadsaw can is connected or disconnected and put into working use.
- The speed of the vehicle engine must never be increased or decreased too fast.
- Suction hose and pump fittings must be checked and tightened on a regular basis.
- Never start or stop the rotor at maximum RPM.
- Avoid sudden arm movements via the joystick and due to irregularities on the ground, as changes in pressure are directed back to the pump and may result in malfunction.
- Avoid letting the rotor hit an object such as a rock, as this will cause pressure changes.
- Never transport the machine with the engine running.
- Never choose a higher PTO RPM/oil flow than recommended.
- Never work with more than the recommended PTO speed/oil flow – this will result in overheating.

NOTE: The engine guarantee is limited to replacement due to defective material or manufacturing. Cavitation, pollution and too high pressure can easily be detected by examination. The guarantee will also be void if the defect is due to misuse.

STORAGE

Before storage always wash the machine carefully. Remove all traces of grass and dirt.



CAUTION

Be careful and never use a high pressure cleaner close to the lacquer. Steam cleaning must be done with caution. Remove all traces of detergents to avoid discolouration or damage to the lacquer. Grease all grease points until fresh grease shows. Slacken rotor drive belts (where fitted). It is important to store the machine covered from rain or sunlight. The machine must be placed horizontally on a level surface or pallet.

CAUTION

Make sure that the machine is unable to tip or fall down when stored. Find a suitable storage place and support the machine.

NOTICE

Never leave hydraulic hoses on the floor. They pose a risk of stumbling. Place all hoses on the machine or the Quadsaw.

NOTICE

Always store the machine in cleaned condition. Dirt attracts moisture and this may result in increased corrosion. Damage to lacquer must be repaired.

NOTICE

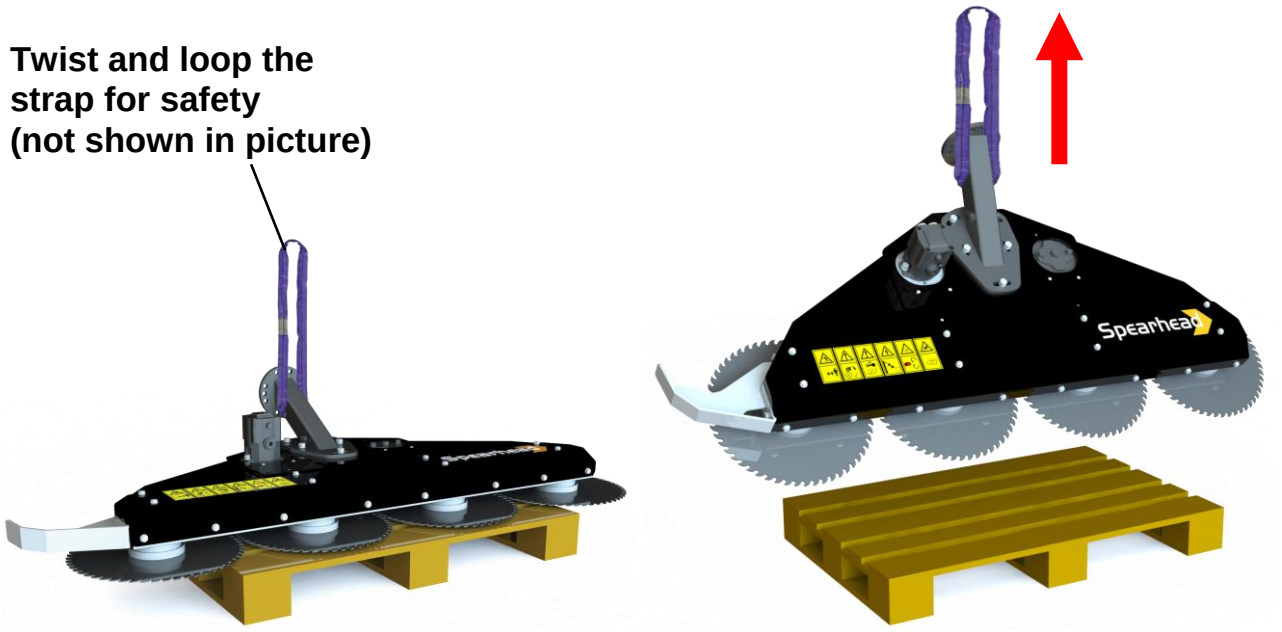
Smear grease on all areas vulnerable to corrosion

REMEMBER:
Regular maintenance will increase the lifespan and the resale price of the machine.

CORRECT LIFTING OF THE QUADSAW

Spearhead recommends that the Quadsaw is stored on a suitable pallet when not in use. If it needs to be moved use a pallet lifter or forklift. Alternatively it can be lifted with an authorized rope or something similar. The 1602 weighs 110 kg, the 2002 weighs 198 kg and the 2402 weighs 239 kg. The rope must be authorized for the required weights as a minimum, but preferably more for greater safety.

Twist and loop the strap for safety (not shown in picture)



After Storage:
Follow the recommended maintenance advice given in this manual. Pay particular attention to the condition of the sawblades and belts.

Remember that the Quadsaw (all models) is constructed to resist even the toughest conditions and that with some care and attention it will supply you with many years of problem-free service. To avoid problems and ensure that it is covered by the guarantee, always use original spare parts and make sure that the machine is not used for anything else than described in this manual.

WARNING!
Before attempting to repair, maintain or adjust the machine, always make sure that the tool has stopped, the ignition key is removed, hydraulics disconnected, hand brake secured and the tool is safe on the ground.

REMEMBER:
Regular maintenance will increase the lifespan and the resale price of the machine.

NOISE MEASURING

Noise measuring has been made on the machine during normal working conditions with a Elma 1350B noise measurer, type ICE 650 type II.

The energy A-weighted sound pressure is lower than: **85 dB (A).**

The test has been done at a distance of 1 metre from the machines critical noise maker and at a height of 1.5m above the ground.

SUPPLIER INFORMATION & CE DECLARATION

Supplier Information:

Company Name: Spearhead Machinery Limited
Address: Green View, Salford Priors, Evesham, Worcestershire
Postcode: WR11 8SW
Telephone: +44 (0)1789 491860
Email: enquiries@spearheadmachinery.com

CE Declaration:

Contact: Spearhead Machinery Limited
Telephone: +44 (0)1789 491860
Email: enquiries@spearheadmachinery.com
Machine No: Spearhead Quadsaw 1602, Quadsaw 2002, Quadsaw 2402
Machine Type: Hydraulic driven tree and branch cutter
Delivery Date:
Delivery Year: 2017

WARNINGS, BANS & DIRECTIONS

Never attempt any maintenance or adjustment without first disengaging the PTO/hydraulic pump.

Only authorised personnel are allowed to do maintenance on the equipment.

Read this manual carefully before using the machine.

DISASSEMBLING

Machine disengaged from all connections.

To ensure the most environmentally friendly removal, the machine must be disassembled and the parts separated as following:

Category	Example of Parts
Rubber & Plastic	Hoses, Rubber Guards, Stabilisers, Plastic Strips etc.
Technical Components	Pumps, Motors, Hydraulic Hoses etc.
Pure Metal	Plates, Pipe Guards, Blades, Pulleys etc.

Disposal must be carried out according to present national and EC legislations.

PROBLEM SOLVING

Problem	Cause	Solution
Valve or engine leak	Too high return oil pressure	Check oil pressure. Free to tank. Change washer.
	Too high leak oil pressure	Check oil pressure. Free to tank. Change washer.
	Return hose not correctly mounted or has fallen off	Install correctly or reinstall. Change seals and/or lid on the valve.
Overheating	Incorrect machine speed	Test RPM on tool.
	Wrong oil level	Check oil level.
	Wrong oil type	Empty the tank and refill with correct oil type.
	Blockage of blades	Remove cuttings/debris.
	Air temperature is too high	Install a hydraulic oil cooler. Reduce operating speed.
Hydraulic failure	Oil level too low	Refill with oil to the correct level.
	Oil leak in pressure hose	Check machine for leaks.
	Oil pump filter is blocked	Replace the filter element.
Branches get “frayed”	Larger branches than recommended	Never exceed the recommended maximum branch sizes of the hedge cutter.
	Working during winter time	Work during growth season.
Cutting result skewed/hacked	Defective rotor bearings	Change bearings.
	Rotor or blade damaged/bent	Change rotor/blade and only work on suitable material.
	Forward drive too fast	Adjust speed.
Tool is shaking	Rotor damaged/bent	Change rotor.
	Weight of blades uneven due to wear	Sharpen until even weight or replace.
	A blade is stuck	Loosen the blade.
	A blade is broken	Replace the blade.
Cuttings are thrown towards the cab	Tool is turned so that the rotor is facing the cab	Only operate as recommended by Spearhead Machinery.
A rotor stops	Belt tension incorrect	Adjust to correct tension.

ORDERING PARTS

When ordering parts, please refer to your parts list to help your dealer with your order. Please provide the following information:

Model Number

Part Number and quantity

Description

Serial number of machine

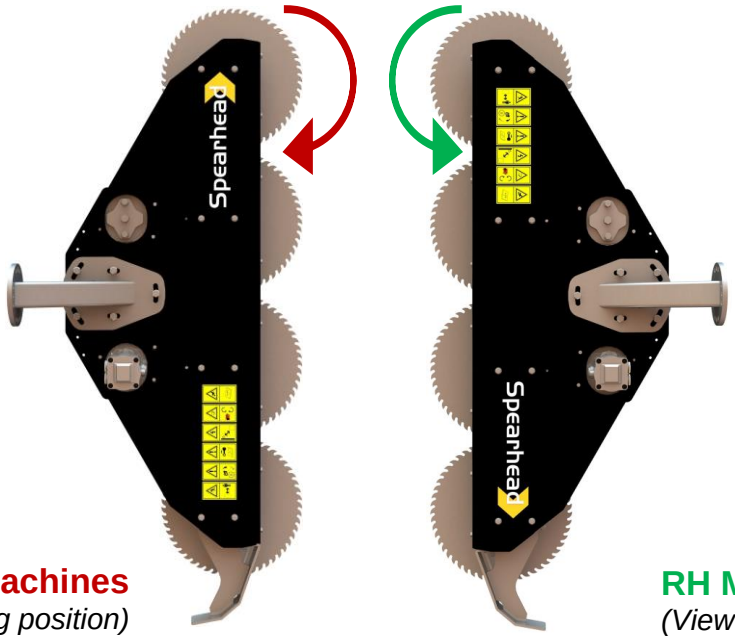
Delivery instructions (e.g. next day)

Delivery is normally via carrier direct to your dealer. Please check with your dealer for stock availability and arrangement of dispatch. Ensure you or your dealer has sufficient cover for parts requirement outside factory hours.

Important Note:
The information contained in this manual is correct at the time of publication. However, in the course of constant development, changes in specification are inevitable. Should you find the information given in this book different to the machine it relates to, please the “After Sales Department” at Spearhead Machinery for advice.

Key:

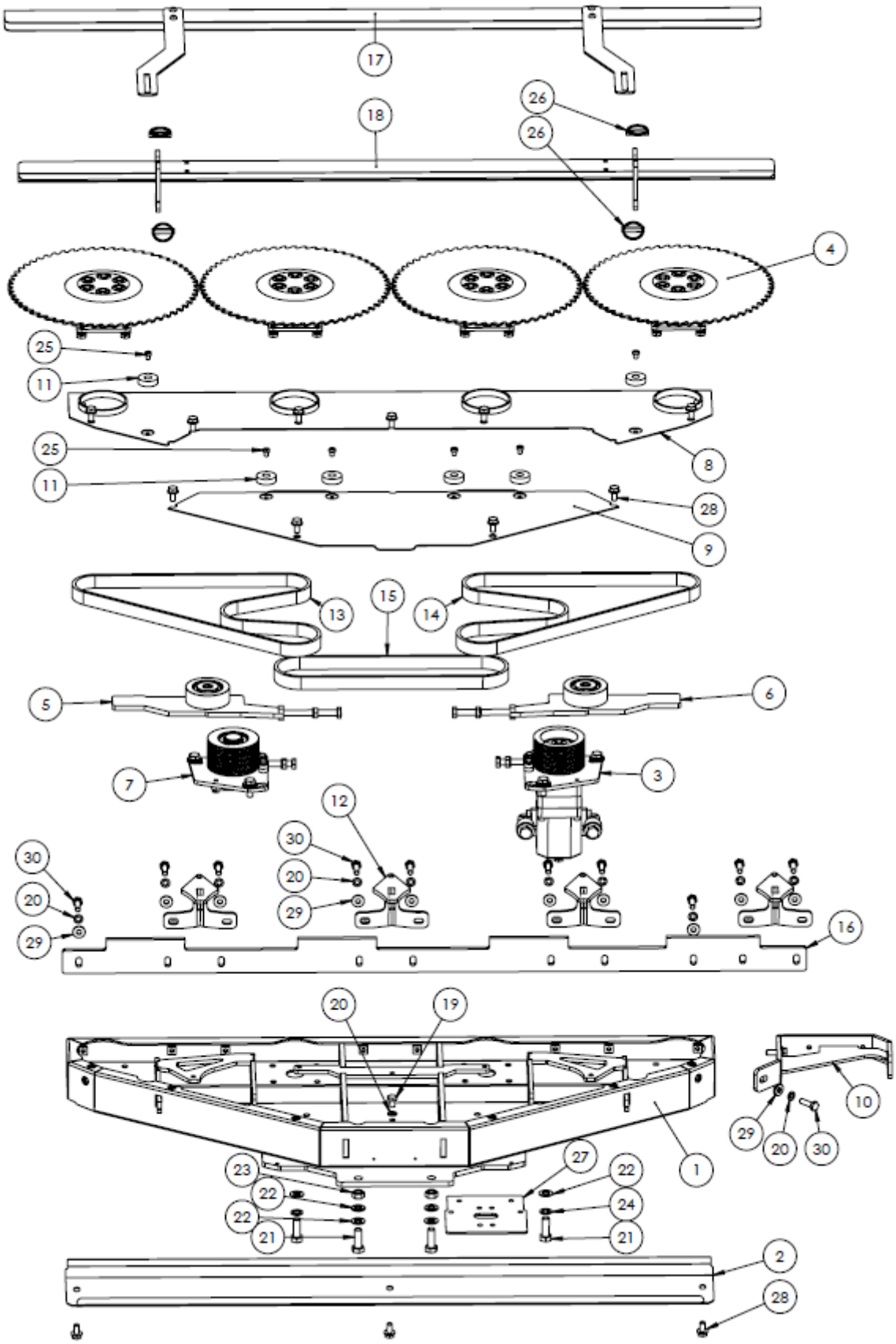
LH: Left Hand Saw
RH: Right Hand Saw



LH Mounted Machines
(Viewed from operating position)

RH Mounted Machines
(Viewed from operating position)

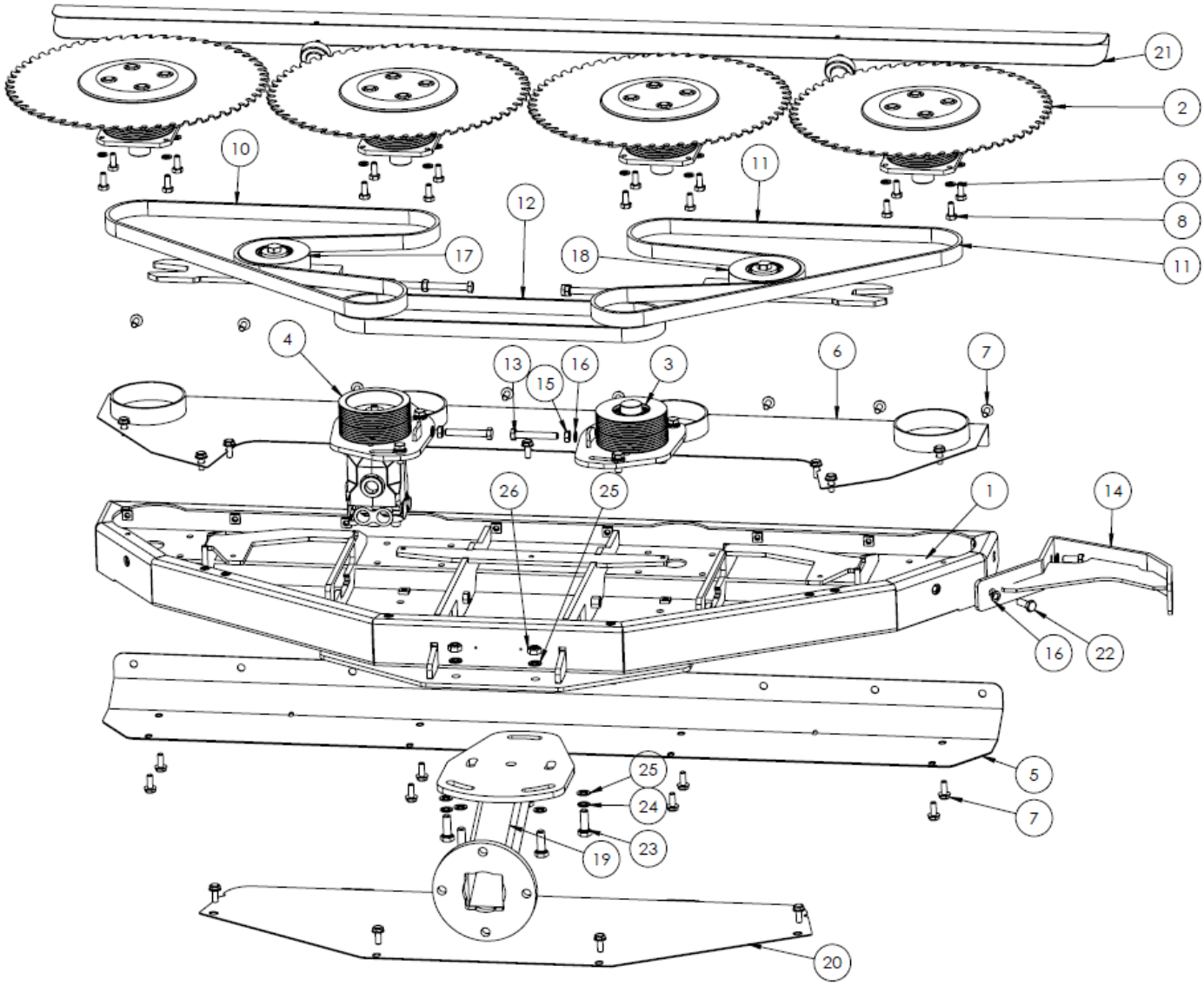
MAIN FRAME – 1602



MAIN FRAME – 1602

ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8171500	MAIN FRAME	1
2	8171000	TOP COVER	1
3		SEE SECTION “MOTOR”	1
4		SEE SECTION “BLADE SHAFT”	4
5		SEE SECTION “SECONDARY TENSIONING SYSTEM”	1
6		SEE SECTION “SECONDARY TENSIONING SYSTEM”	1
7		SEE SECTION “PRIMARY TENSIONING SYSTEM”	1
8	8171501	LOWER COVER	1
9	8171004	COVER	1
10	8171502	SKID	1
11	8178002	WASHER	6
12	8171506	BRANCH CARRIER	4
13+14	8174006	BELT	1
15	160141.0	MOTOR BELT	1
16	8178001	PLASTIC STRIP	1
17	8171504	COVER	1
18	8171505	TRANSPORT PROTECTION	1
19	8172001	BOLT	5
20	2770536	WASHER	15
21	8222007	BOLT	4
22	8222009	FACET WASHER	6
23	1061042	LOCK NUT	2
24	8222008	WASHER	2
25	8172002	BOLT	6
26	8486002	LYNCH PIN	4
27	8171503	ADAPTOR	1
28	200104.0	BOLT	14
29	8142003	WASHER	12
30	2770396	BOLT	12
NOT SHOWN	8221503	SPEARHEAD TWIGA ADAPTOR	1
NOT SHOWN	8222008	SPEARHEAD TWIGA ADAPTOR BOLT	4

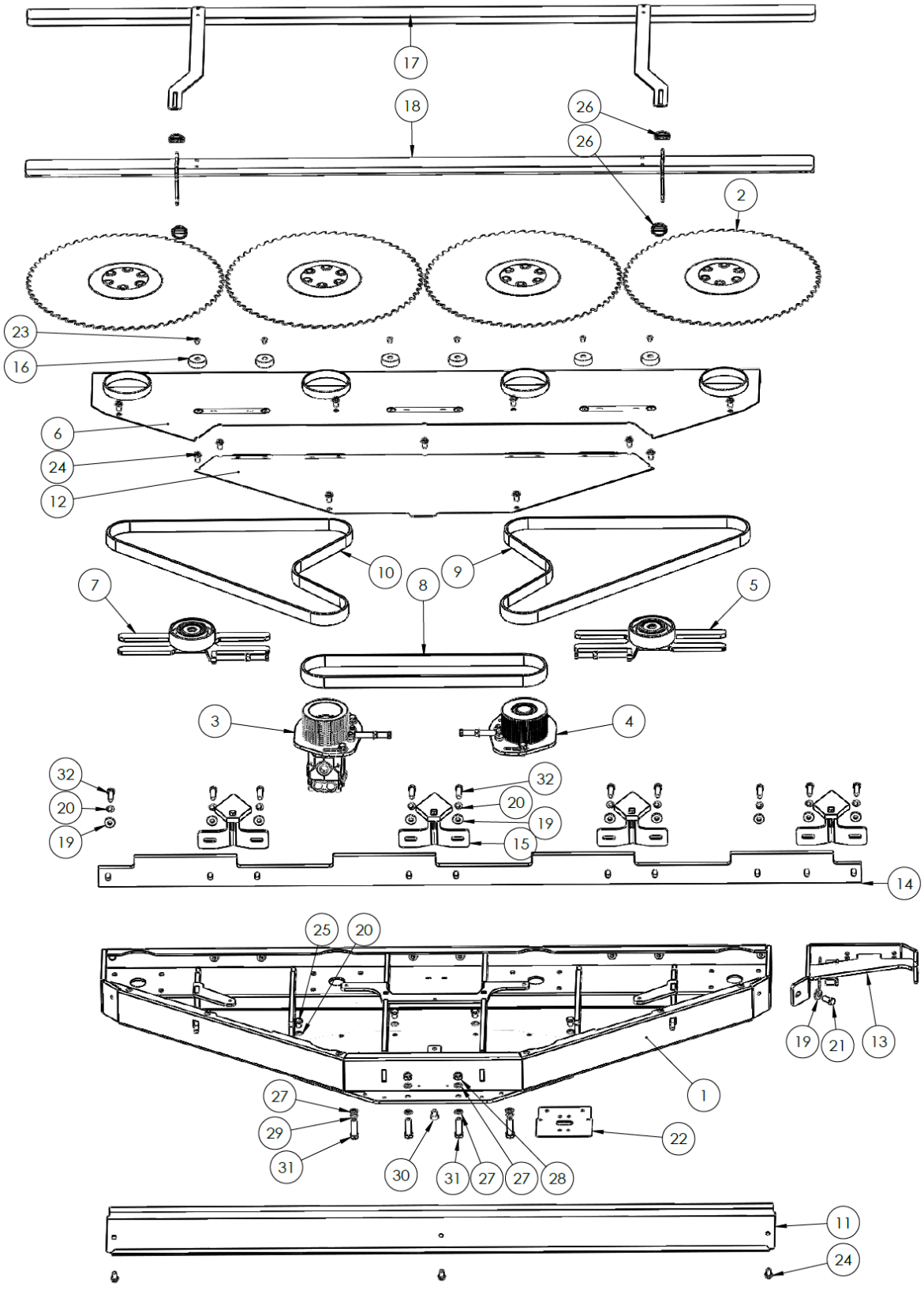
MAIN FRAME – 2002



MAIN FRAME – 2002

ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8221500	MAINFRAME	1
2		SEE SECTION “BLADE SHAFT”	4
3		SEE SECTION “PRIMARY TENSIONING SYSTEM”	1
4		SEE SECTION “MOTOR”	1
5	8221000	TOP COVER	1
6	8221501	LOWER COVER	1
7	8222001	BOLT	29
8	8222002	BOLT	16
9	8222003	LOCK WASHER	16
10	8224001	BELT	1
11	8224001	BELT	1
12	200141.0	MOTOR BELT	1
13	8222004	ADJUSTER BOLT	2
14	8221502	SKID	1
15	2770536	NUT	2
16	8222005	LOCK WASHER	4
17		SEE SECTION “SECONDARY TENSIONING SYSTEM”	1
18		SEE SECTION “SECONDARY TENSIONING SYSTEM”	1
19	8221503	SPEARHEAD TWIGA ADAPTOR	1
20	8221001	INSPECTION LID	1
21	8221504	TRANSPORT PROTECTION BLADE GUARD	1
NOT SHOWN	8758005	TRANSPORT PROTECTION BLADE GUARD HANDLE	2
22	8222006	BOLT	2
23	8222007	BOLT	5
24	8222008	LOCK WASHER	3
25	8222009	FACET WASHER	7
26	1061042	LOCK NUT	2

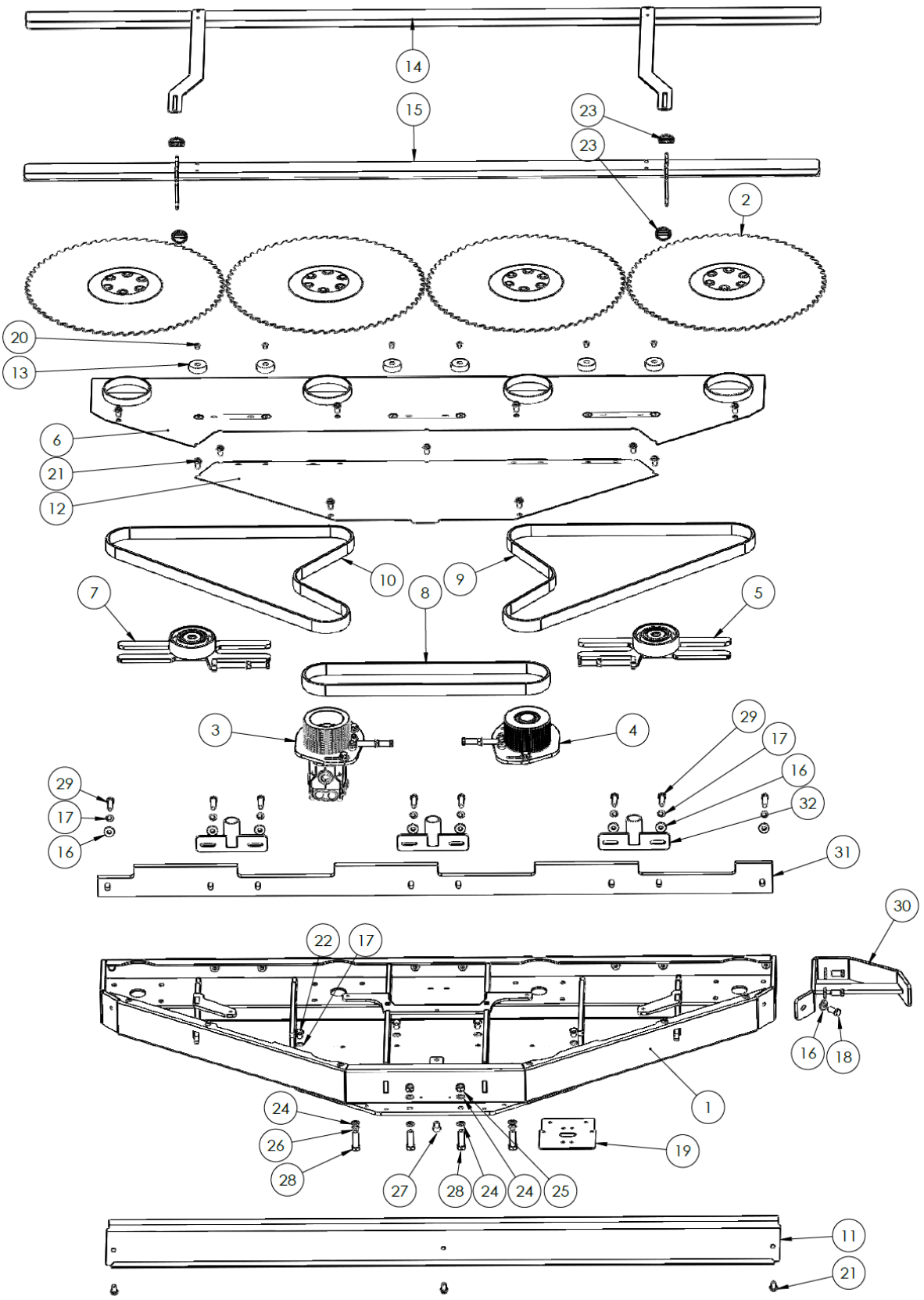
MAIN FRAME GT – 2402



MAIN FRAME GT – 2402

ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8251500	MAIN FRAME	1
2		SEE SECTION “BLADE SHAFT”	4
3		SEE SECTION “MOTOR”	1
4		SEE SECTION “PRIMARY TENSIONING SYSTEM”	1
5		SEE SECTION “SECONDARY TENSIONING SYSTEM”	1
6	8251501	LOWER COVER	1
7		SEE SECTION “SECONDARY TENSIONING SYSTEM”	1
8	8254001	BELT FOR MOTOR	1
9 + 10	8254002	BELT	2
11	8251000	TOP COVER	1
12	8251502	COVER	1
13	8251503	SKID	1
14	8258001	COVER	1
15	8251504	BRANCH CARRIER	4
16	8258002	PLASTIC WASHER	6
17	8251505	COVER	1
18	8251506	TRANSPORT PROTECTION	1
19	8222011	WASHER	13
20	8222005	WASHER	16
21	8222006	BOLT	3
22		ADAPTOR	1
23	200163.0	BOLT	6
24	200104.0	BOLT	14
25	8252001	BOLT	6
26	6706004	SPLIT PIN	4
27	8222009	WASHER	7
28	1061042	NYLOCK NUT	2
29	8222008	WASHER	3
30	8222014	BOLT	1
31	8252002	BOLT	5
32	8172001	BOLT	10

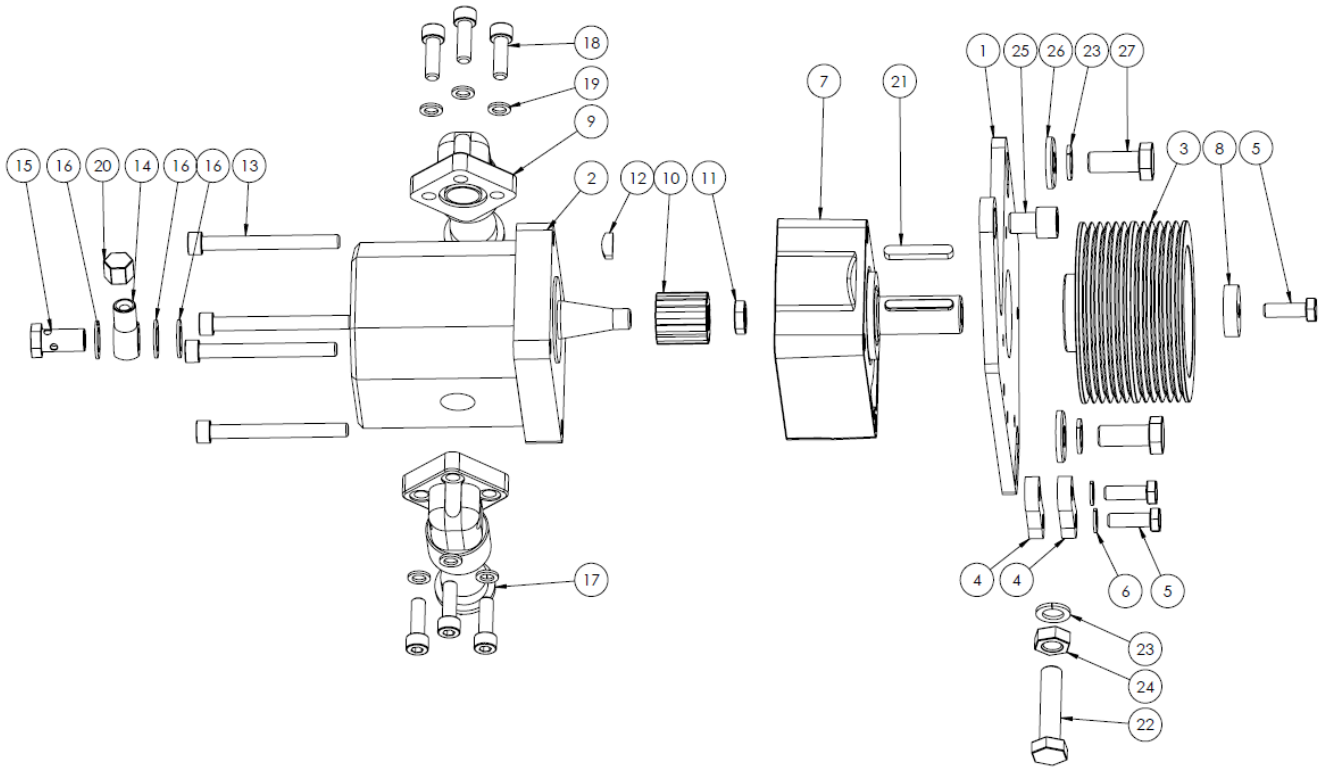
MAIN FRAME PL – 2402



MAIN FRAME PL – 2402

ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8171500	MAIN FRAME	1
2		SEE SECTION “BLADE SHAFT”	4
3		SEE SECTION “MOTOR”	1
4		SEE SECTION “PRIMARY TENSIONING SYSTEM”	1
5		SEE SECTION “SECONDARY TENSIONING SYSTEM”	1
6	8251501	LOWER COVER	1
7		SEE SECTION “SECONDARY TENSIONING SYSTEM”	1
8	8254001	BELT FOR MOTOR	1
9 + 10	8254002	BELT	2
11	8251000	TOP COVER	1
12	8251502	COVER	1
13	8258002	WASHER	6
14	8251505	COVER	1
15	8251506	TRANSPORT PROTECTION	1
16	8222011	WASHER	11
17	8222005	WASHER	14
18	8222006	BOLT	3
19		ADAPTOR	1
20	200163.0	NUT	6
21	200104.0	BOLT	14
22	8252001	BOLT	6
23	6706004	SPLIT WASHER	4
24	8222009	WASHER	7
25	1061042	NUT	2
26	8252008	WASHER	3
27	8252014	BOLT	1
28	8252002	BOLT	5
29	8172001	BOLT	8
30	8251509	SKID	1
31	8258003	PLASTIC STRIP	1
32	8251510	BRANCH CARRIER PL	3

MOTOR – 1602



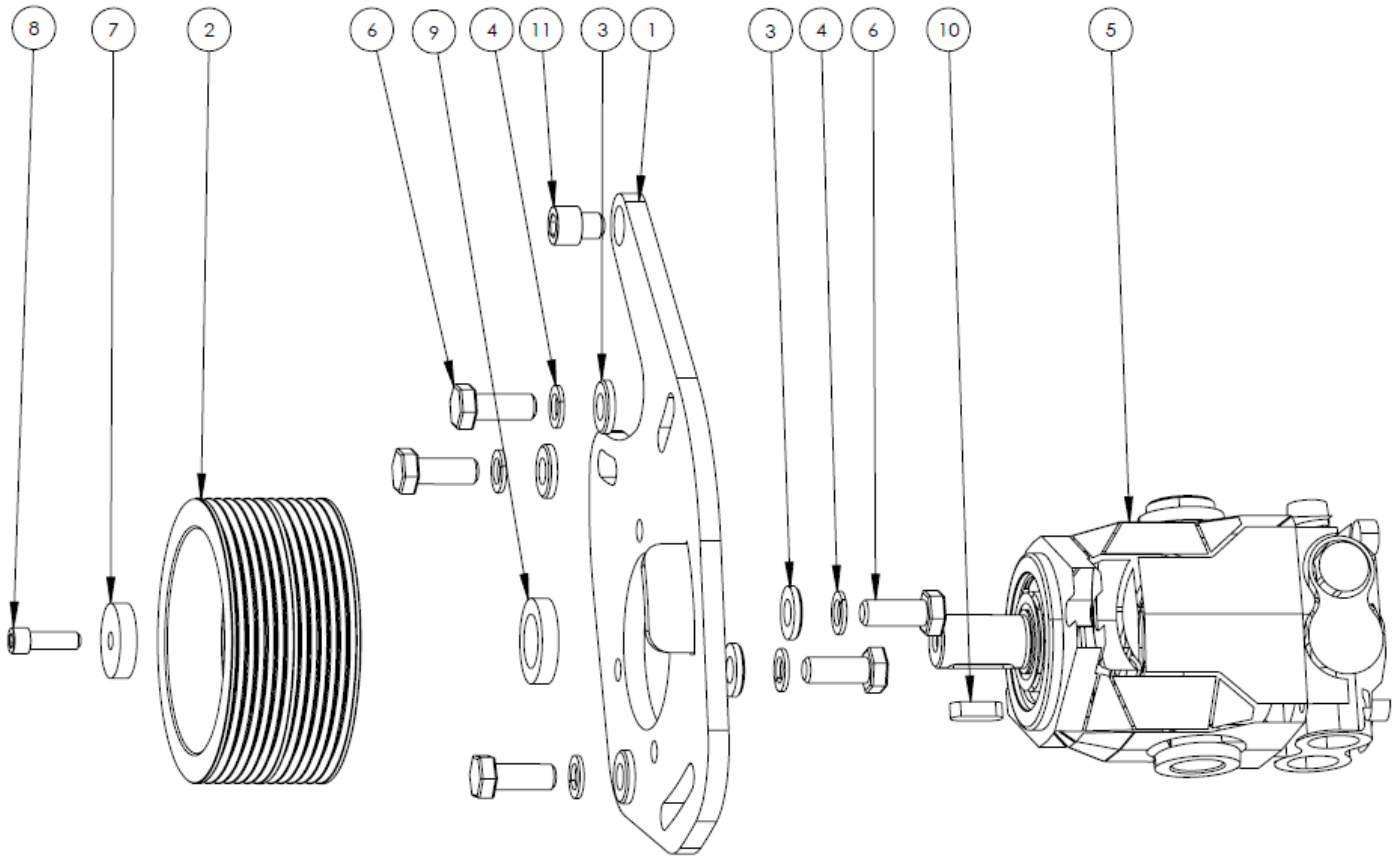
8221508LH

8221508RH

MOTOR – 1602

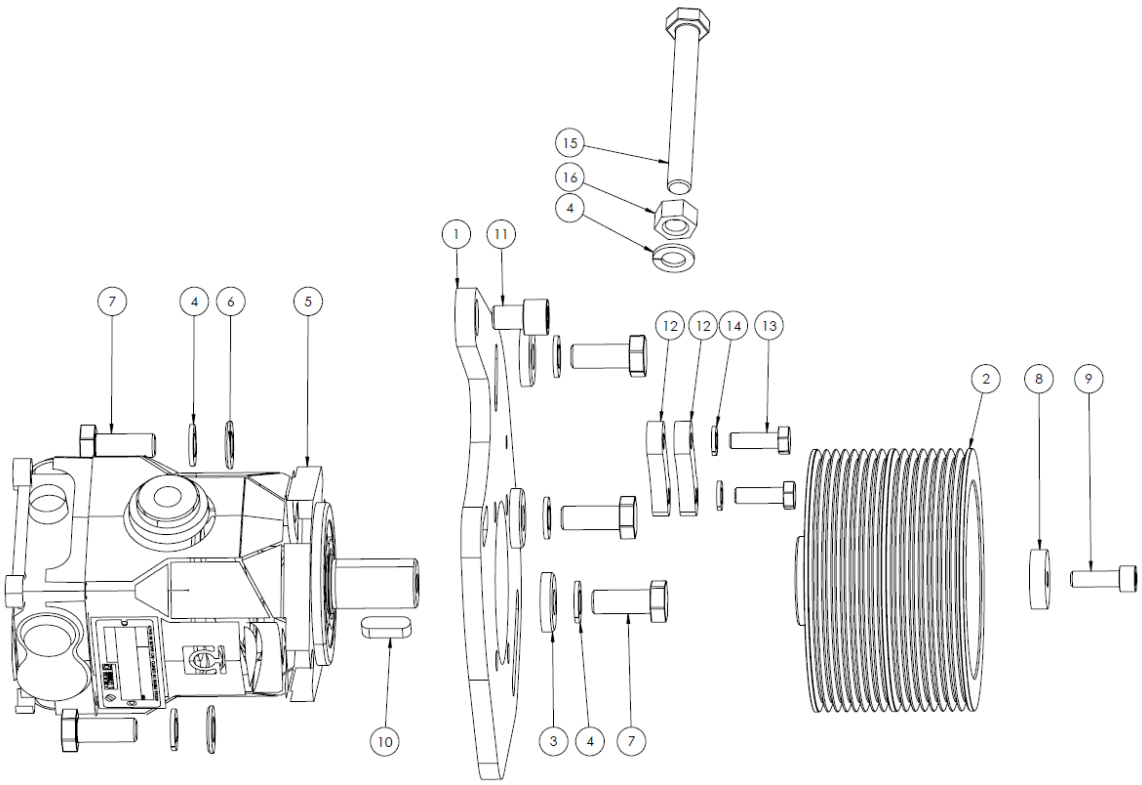
ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8171005	ADJUSTER PLATE RH (SEE DRAWING)	1
2	200130.0	MOTOR HPLMA217BMLE5E5B0	1
	200160.0	SEALKIT TO 200130.0	
3	8174003	PULLEY	1
4	8171006	STOP	2
5	200139.0	BOLT	3
6	200156.0	WASHER	2
7	200131.0	PULLEY SUPPORT	1
8	200138.0	PULLEY WASHER	1
9	200132.0	PORT ELBOW	2
10	200133.0	SPLINE PTO	1
11	1021512	NUT	1
12	1551004	KEY	1
13		BOLT	4
14	8173001	BANJO	1
15	8173002	BANJO BOLT	1
16	8143005	BONDED SEAL	3
21	200134.0	KEY	1
22	8172001	BOLT	1
23	8222005	WASHER	3
24	2770536	NUT	1
25	8222014	BOLT	1
26	8222011	WASHER	2
27	8222006	BOLT	2

MOTOR – 2002



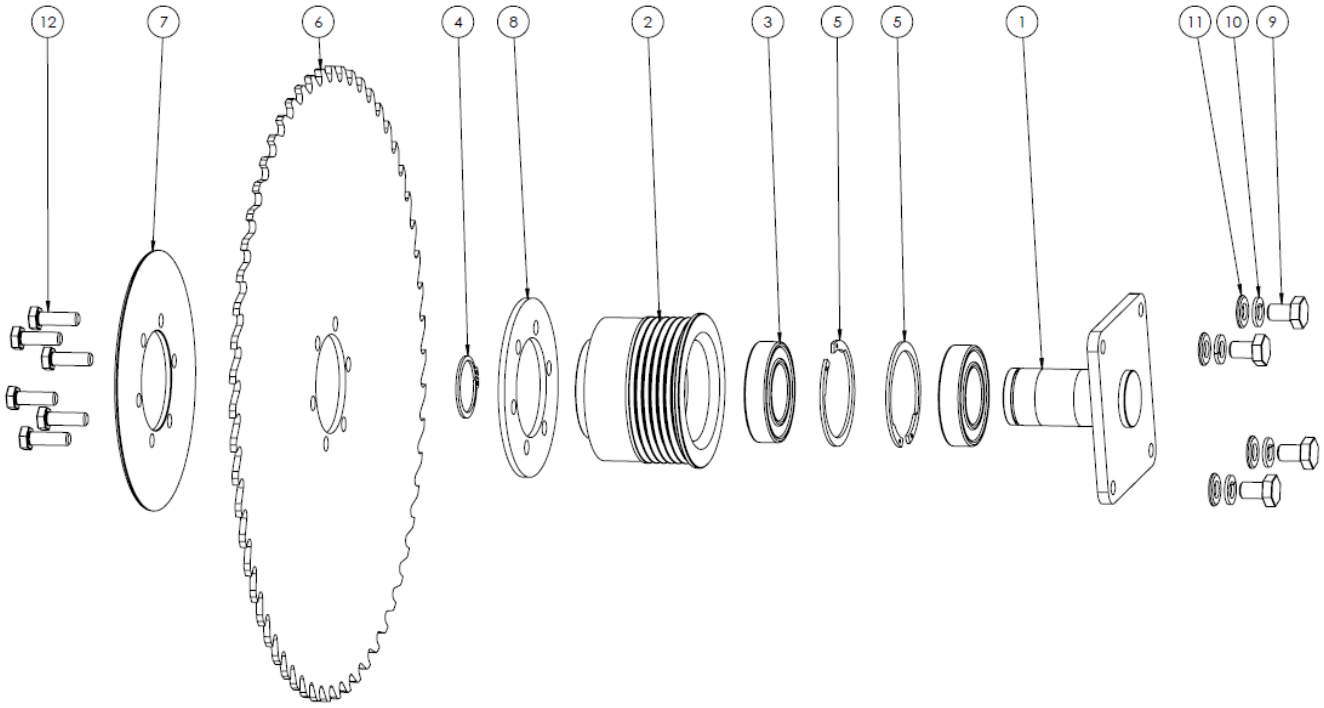
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	8221508	ADJUSTER PLATE	1
2	8221011	PULLEY	1
3	8222011	FLAT WASHER	5
4	8222005	LOCK WASHER	5
5	200231.0	MOTOR	1
5	200230.0	MOTOR	1
NOT SHOWN	200230A	SHAFT SEAL KIT FOR MOTOR	1
	200230B	SEAL KIT COMPLETE	1
	200230C	SHAFT REPAIR KIT WITH BEARING + 200230A	1
6	8222006	BOLT	5
7	200138.0	PULLEY WASHER	1
8	200139.0	BOLT	1
9	8221012	DISTANCE RING	1
10	200234.0	KEY	1
11	8222014	BOLT	1

MOTOR – 2402



ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8251001	ADJUSTER PLATE RH	1
2	8254003	PULLEY	1
3	8222011	WASHER	3
4	8222005	WASHER	6
5		MOTOR	1
6	2770434	WASHER	2
7	8222006	BOLT	5
8	200138.0	WASHER	1
9	8362010	BOLT	1
10	8484005	KEY	1
11	8222014	BOLT	1
12	8251002	STOP	2
13	200139.0	BOLT	2
14	200156.0	WASHER	2
15	8172004	BOLT	1
16	2770536	NUT	1

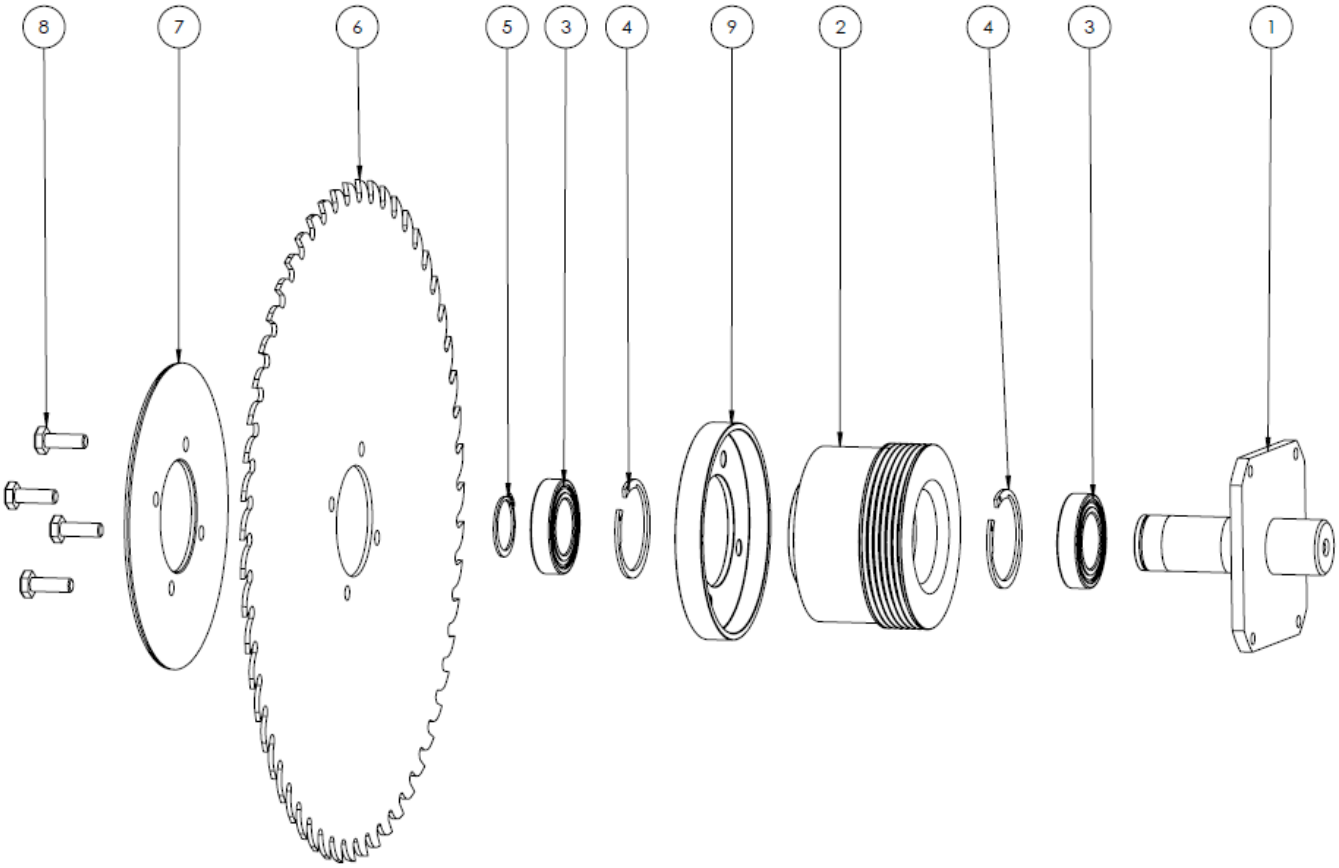
BLADE SHAFT – 1602



ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8171003	AXLE	1
2	8174002	PULLEY	1
3	8174001	BEARING	2
4	0162001.0	LOCK RING	1
5	200119.0	LOCK WASHER	2
6	7770813	SAW BLADE Ø390 – ALAMO	1
NOT SHOWN		WOODEN BOX FOR BLADES	1
7	8171001	MOUNTING PLATE	1
8	8171002	DUST PLATE	1
9	8142002	BOLT	4
10	8222003	LOCK WASHER	4
11	2000436	WASHER	4
12	200139.0	BOLT	6

*** NOTE – QUANTITY IS FOR EACH SHAFT ***

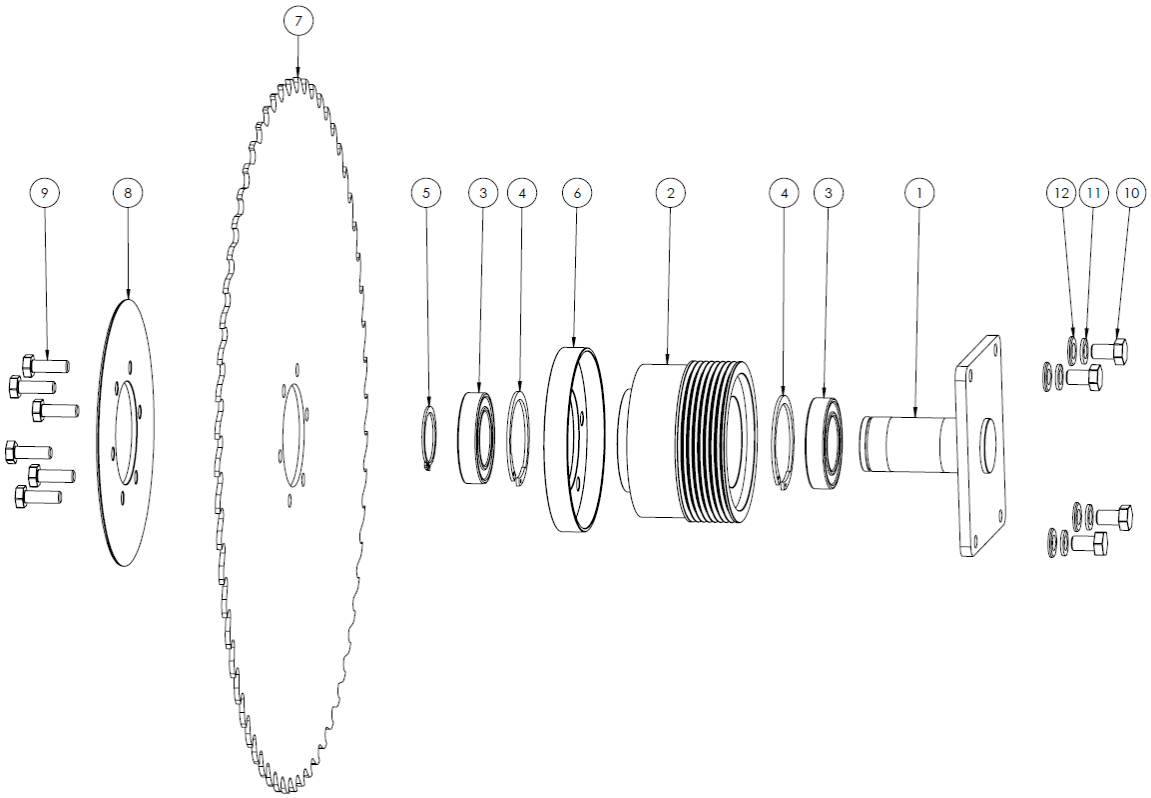
BLADE SHAFT – 2002



ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8221505	AXLE	1
2	8221002	PULLEY	1
3	8224002	BEARING	2
4	2771110	LOCKING RING	2
5	240120.0	LOCKING RING	1
6	7770791	SAW BLADE Ø490	1
NOT SHOWN	200111K	WOODEN BOX FOR BLADES	1
7	8221003	MOUNTING PLATE	1
8	8222010	BOLT	4
9	8221004	DUST PLATE	1

*** NOTE – QUANTITY IS FOR EACH SHAFT ***

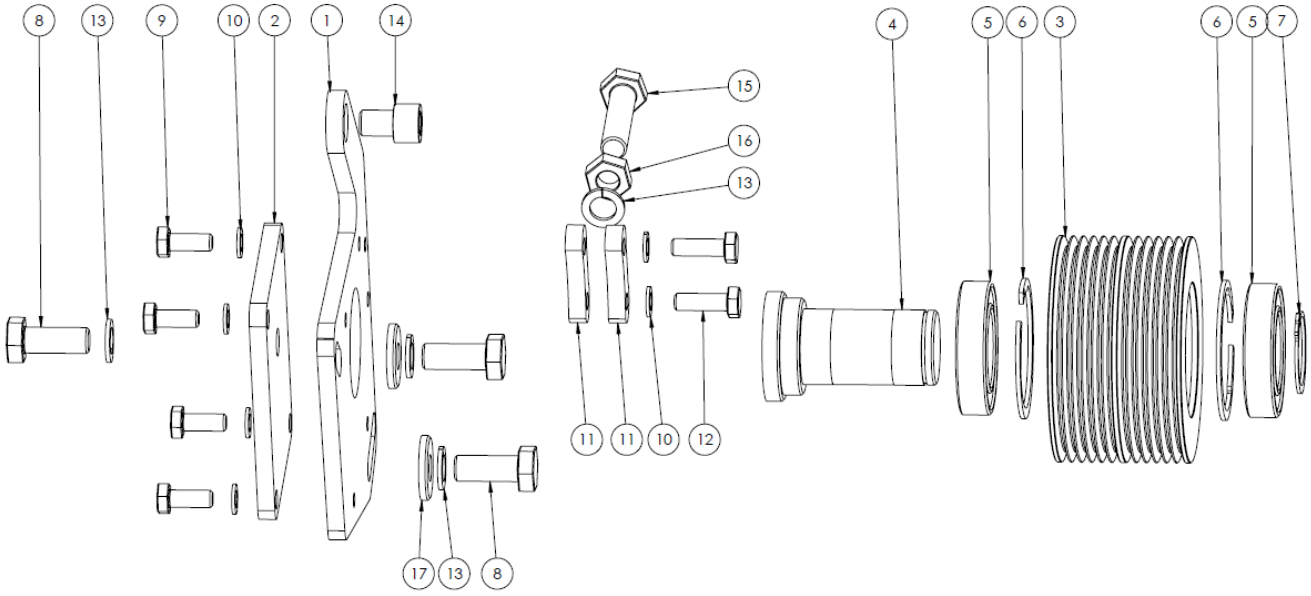
BLADE SHAFT – 2402



ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8251507	AXLE	1
2	8254005	PULLEY	1
3	8254007	BEARING	2
4	8252003	WASHER	2
5	2777518	CIRCLIP	1
6	8251005	DUST PLATE	1
NOT SHOWN		WOODEN TRANSPORT BOX	1
7	7770814	SAW BLADE Ø590	1
8	8251006	MOUNTING PLATE	1
9	8222010	BOLT	6
10	8222002	BOLT	4
11	8222005	WASHER	4
12	2770434	WASHER	4

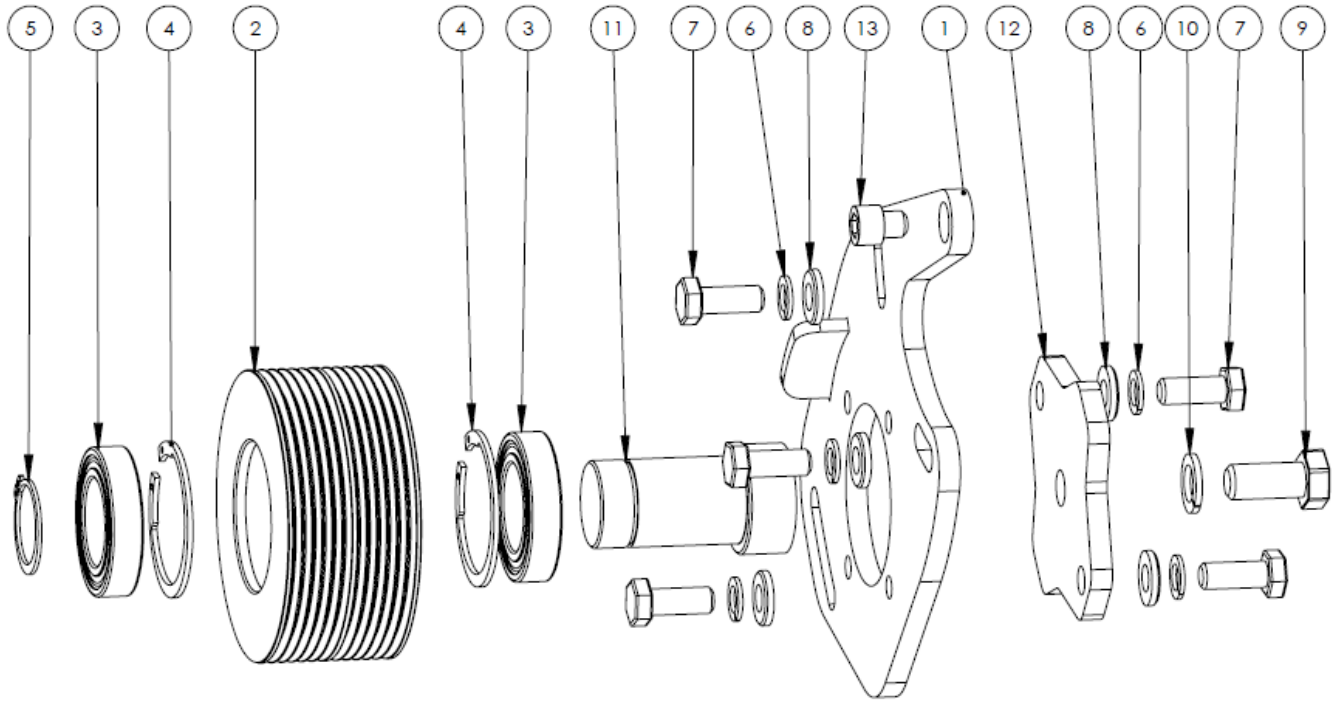
*** NOTE – QUANTITY IS FOR EACH SHAFT ***

PRIMARY TENSIONING SYSTEM – 1602



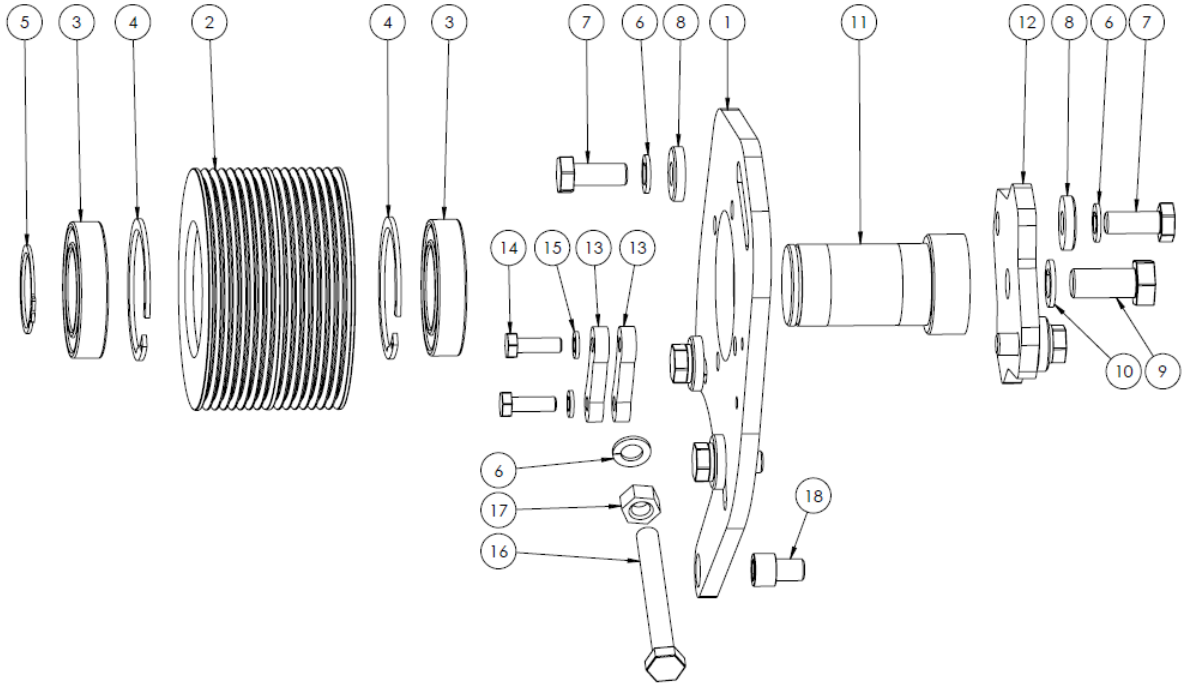
ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8171005	ADJUSTER PLATE RH/LH	1
2	8171009	BLANKING COVER	1
3	8174005	PULLEY	1
4	8171010	SHAFT/AXLE	1
5	8174001	BEARING	2
6	200119.0	LOCKING RING	2
7	0162001.0	LOCKING RING	1
8	8222006	BOLT	1
9	2770402	BOLT	4
10	2001560	WASHER	6
11	8171006	STOP	2
12	200139.0	BOLT	2
13	8222005	WASHER	1
14	8222014	BOLT	1
15	8172001	BOLT	1
16	2770536	NUT	1
17	8222011	WASHER	2
NOT SHOWN	200155.0	TOOL FOR BELT TENSION CONTROL “OPTIKRIK II”	1

PRIMARY TENSIONING SYSTEM – 2002



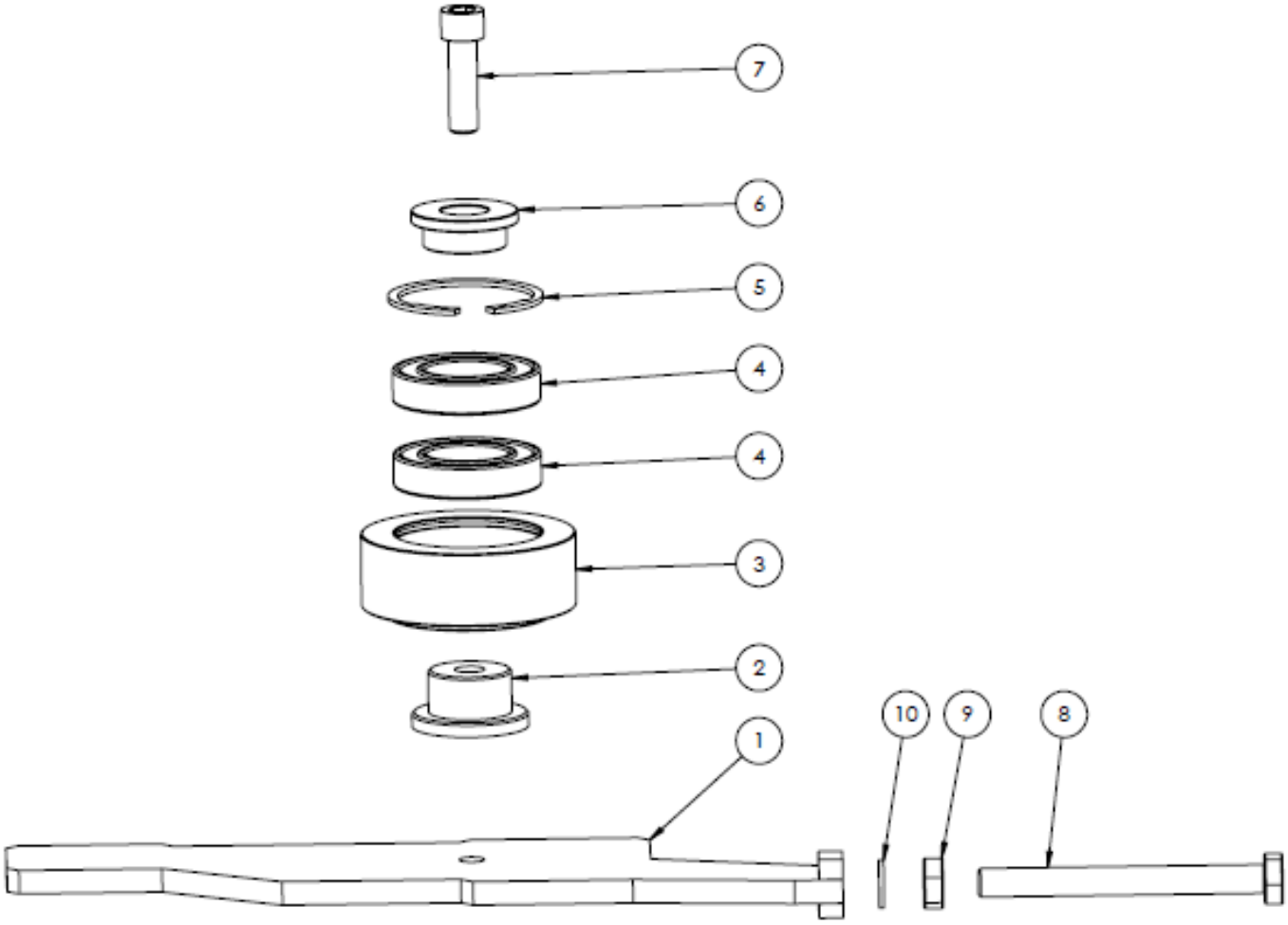
ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8221506	ADJUSTER PLATE	1
2	8221005	PULLEY	1
3	8224002	BEARING	2
4	2771110	LOCKING RING	2
5	240121.0	LOCKING RING	1
6	8222005	LOCK WASHER	5
7	8222006	BOLT	5
8	8222011	FLAT WASHER	5
9	8222012	BOLT	1
10	8222013	LOCK WASHER	1
11	8221006	SHAFT/AXLE	1
12	8221007	BLANKING COVER	1
13	8222014	BOLT	1
NOT SHOWN	200155.0	TOOL FOR BELT TENSION CONTROL “OPTIKRIK II”	1

PRIMARY TENSIONING SYSTEM – 2402



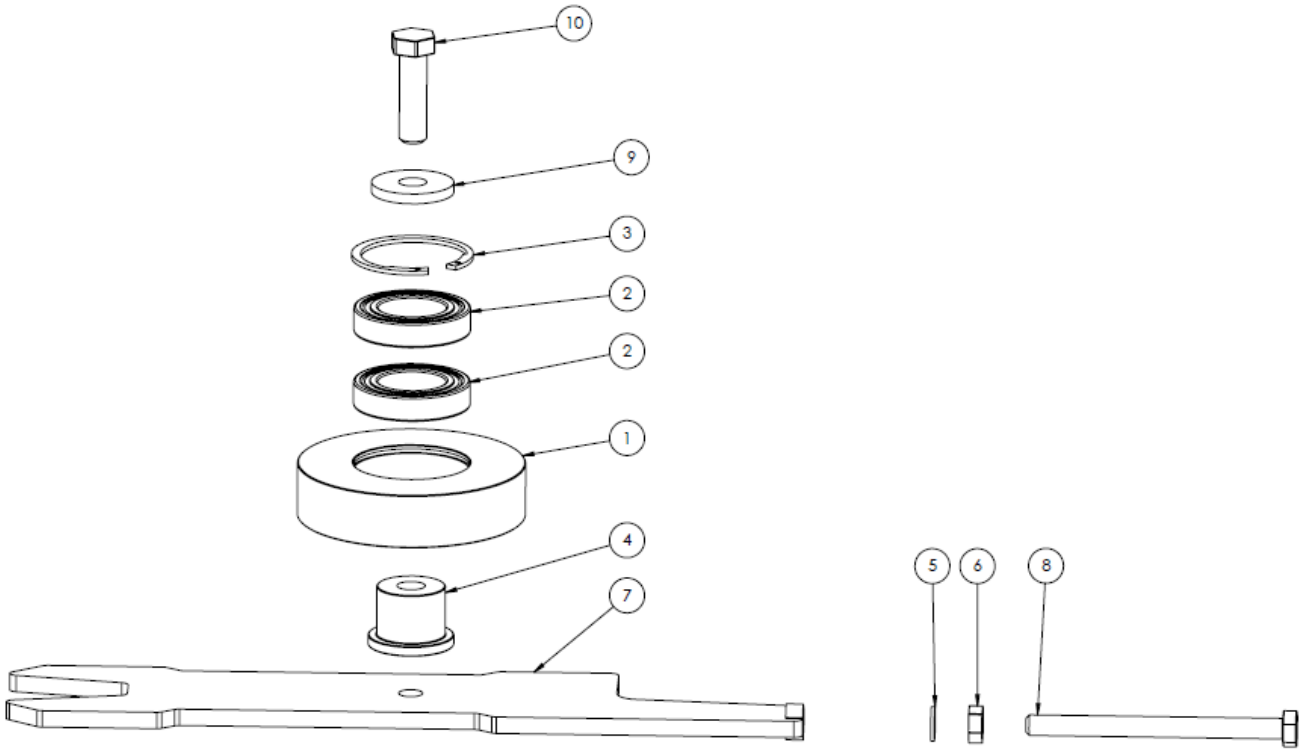
ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8251001	ADJUSTER PLATE LH/RH	1
2	8254006	PULLEY	1
3	8254007	BEARING	2
4	8252003	CIRCLIP	2
5	2777518	CIRCLIP	1
6	8222005	WASHER	6
7	8222006	BOLT	5
8	8222011	WASHER	5
9	8222012	BOLT	1
10	8222013	WASHER	1
11	8251003	SHAFT	1
12	8251004	ADAPTOR PLATE	1
13	8251002	STOP	2
14	200139.0	BOLT	2
15	200156.0	WASHER	2
16	8172004	BOLT	1
17	2770434	NUT	1
18	8222014	BOLT	1
NOT SHOWN	200155.0	BELT TENSION TOOL “OPTIKRIK II”	1

SECONDARY TENSIONING SYSTEM – 1602



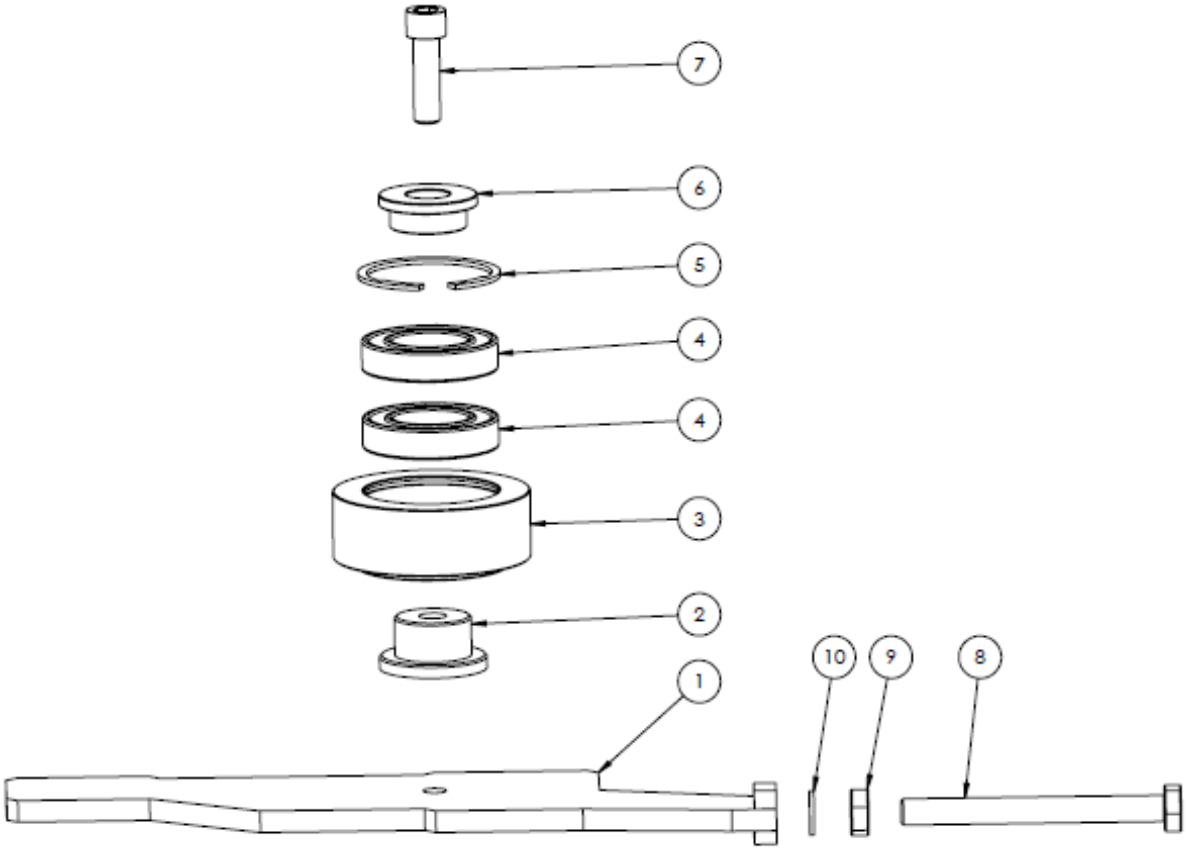
ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8171509	ADJUSTER FORK	1
2	8171007	SHAFT	1
3	8174004	TENSIONER WHEEL	1
4	8174001	BEARING	2
5	200119.0	LOCKING RING	1
6	8171008	WASHER	1
7	8172003	CSK SKT BOLT	1
8	8172004	BOLT	1
9	2770536	NUT	1
10	8222005	LOCK WASHER	1

SECONDARY TENSIONING SYSTEM – 2002



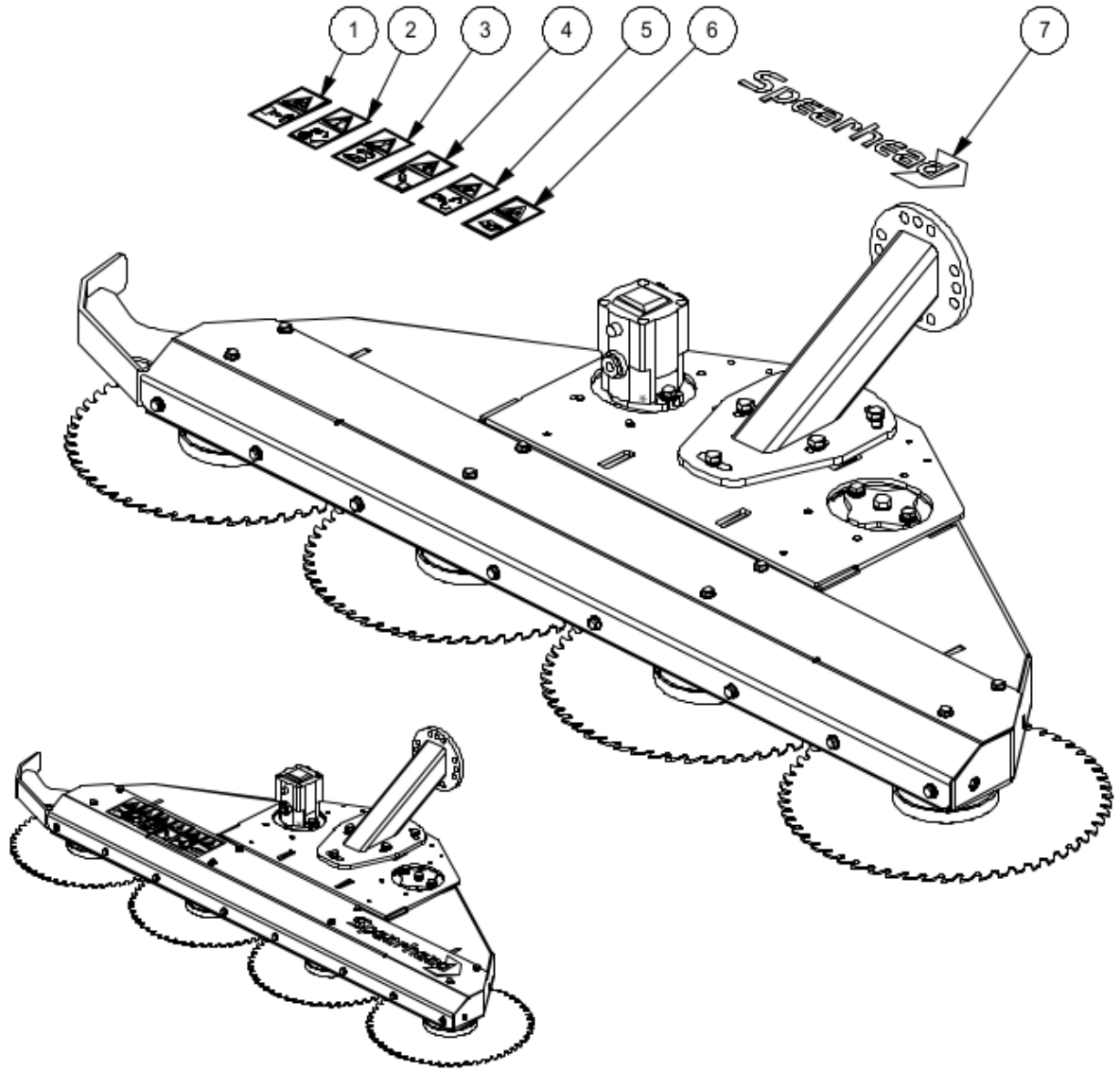
ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8221008	TENSIONER WHEEL	1
2	8224002	BEARING	2
3	2771110	LOCKING RING	1
4	8221009	SHAFT	1
5	8222005	LOCK WASHER	1
6	2770536	NUT	1
7	8221507	ADJUSTER FORK	1
8	8222015	BOLT	1
9	8221010	WASHER	1
10	8222016	BOLT	1

SECONDARY TENSIONING SYSTEM – 2402



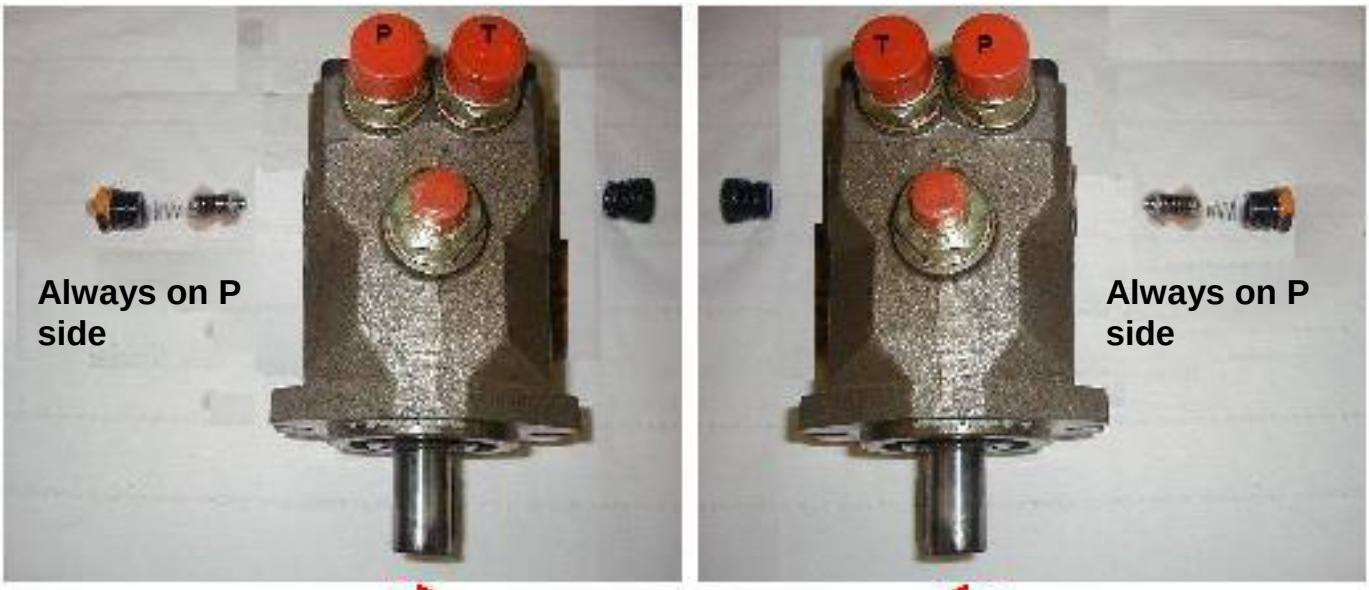
ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8251508	ADJUSTER FORK	1
2	8251007	SHAFT	1
3	8254004	TENSIONER WHEEL	1
4	8254007	BEARING	2
5	8252003	CIRCLIP	1
6	8251008	TOP SHAFT	1
7	8252004	BOLT	1
8	8252005	ADJUSTER BOLT	1
9	2770536	NUT	1
10	8222005	WASHER	1

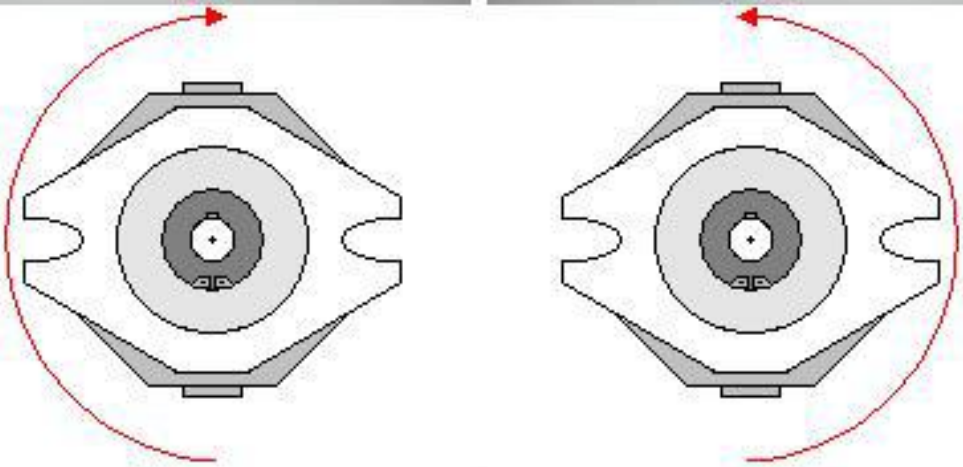
S180020.101 – QUADSAW SPEARHEAD SAFETY & MARKETING DECALS – 1602/2002/2402



ITEM NO.	PART NO.	DESCRIPTION.	QTY.
1	8770357	STAND CLEAR OF MACHINE DECAL	1
2	8770306	KEEP BOLTS TIGHT DECAL	1
3	8770358	REMOVE KEY READ MANUAL DECAL	1
4	8770359	PYLONS DECAL	1
5	8770361	ROTARY DANGER DECAL	1
6	8770362	AVOID FLUID ESCAPING DECAL	1
7	8770374	SPEARHEAD DECAL	1

PISTON MOTOR INFORMATION





Check Valve

Anti-Cavitation Spring

New motors are always delivered without a relief valve. Use the one from the earlier motor. Mount it in the same side as previously. On the Quadsaw, this points against the centre. Take care when mounting and DO NOT use air tools.

WARNING

Fill the motor with oil before starting it; roughly 100ml.

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