Spearhead Machinery
Operator Instruction Manual For

QUADSAW

FOR MACHINES WITH WGC 4.9562669

1.50m cut width

Vegetation control hydraulic drive saw blade attachment

8999195EN v1.0

IMPORTANT
Verification Of Warranty Registration

Dealer Warranty Information & Registration Verification

It is imperative that the selling dealer registers this machine with Spearhead 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:

https://my.spearheadmachinery.com/warranty/machine-registration/

Should you experience any problems registering a machine in this manner please contact the Spearhead Service Department on 01789 491860.

Confirm to the customer that the machine has been registered in the section below.

Registration Verification

Model Type:		**Quadsaw**
Model Number:		**4.9562669**
Serial Numbers:	**Machine:**	**S_____**
	Cutting Implement:	**S_____**
	Other:	
Name Of Owner:		
Name Of Installing Dealer:		
Dealer Address:		
Dealer Signature:		
Date Of Delivery / Installation:		
Date Of Warranty Registration:		

IMPORTANT

At the point of transfer of ownership record the above information. Note the serial number of your machine and always quote it in any communication with us or your dealer. (The serial number plate is located on the machine mainframe.) This is particularly important when ordering spares. Remember to include all numbers and letters.

The information given throughout this manual is correct at the time of publication. However, in the course of constant development of Spearhead machines, changes in specification are inevitable. Should you find the information given in this book to be at variance with the machine in your possession, you are advised to contact the Spearhead Service department where up-to-date information will be provided.

The manual can contain standard and optional features and is not to be used as a machine specification. The machine has been tested and is considered safe if carefully used. Ensure your operator is properly trained in its use and maintenance.

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Quadsaw

Spearhead heavy-duty Quadsaws are hydraulic boom mounted sawblade attachments for the cutting of trees and branches. With a working width of 1.5m, the SP15 Quadsaw is equipped with four belt-driven tungsten carbide tipped sawblades capable of cutting materials up to 150mm diameter.

Designed for use on Twiga carrier arms and Twiga Carrier loader arms, Quadsaw is the ideal machine for farmers, forestry teams and contractors alike.

IMPORTANT: This machine must only be used to perform the tasks for which it was designed, use for any other purpose may be dangerous to persons and damaging to the machine.

IMPORTANT

This operator's manual should be regarded as part of the machine. Suppliers of both new and second-hand machines are advised to retain documentary evidence that this manual was provided with the machine.

This machine is designed solely for ground vegetation control and must not be used for any other purpose. Use in any other way is considered as contrary to the intended use. Compliance with, and strict adherence to, the conditions of operation, service, and repair, as specified by the manufacturer, also constitute essential elements of the intended use.

This machine should be operated, serviced, and repaired only by persons who are familiar with its characteristics and who are acquainted with the relevant safety procedures.

Accident prevention regulations, all other generally recognised regulations on safety and occupational medicine, and all road traffic regulations must always be observed.

Any arbitrary modifications carried out to this machine may relieve the manufacturer of liability for any resulting damage or injury.

It is potentially hazardous to fit or use any parts other than genuine **Spearhead** parts.

The company disclaims all liability for the consequences of such use which, in addition, voids the machine warranty.

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Contents List

1 Introduction

This manual describes the conditions of use and maintenance. It is an integral part of the Saw Head. It defines what the Saw Head was built for and comprises the information needed to guarantee proper and safe use.

The Saw Head is intended for professional use and only specialist personnel may use it. Its use is prohibited to minors, persons who have physical or mental health issues as well as persons who are insufficiently informed and trained.

1.1 Characteristics And Manual Updates

All of the technical support and the description provided in this manual is the exclusive property of SPEARHEAD that prohibits its reproduction, whether in full or in part, without their express written authorisation and permission.

The contents of this manual may be subject to change at any time. SPEARHEAD reserves the right to make any changes that they see fit at any time, with a view to improving the Saw Head or for any manufacturing or sales needs.

The illustrations and the technical data provided in this manual may not all correspond precisely to your Saw Head. Conditions of use do however remain unchanged.

1.2 Retaining The Manual

This manual must be kept carefully in a suitable location to guarantee that it remains in good condition. It must be easily accessible to anyone authorised to access it. The manual is an important document that accompanies the Saw Head and all users are responsible for keeping it in good condition. Always pass it on to the new owner in case of resale.

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2 Intended Usage

The Saw Head is designed for use in cutting branches, field borders, edges, access paths, fruit trees, hedges... It will cut all varieties of wood, hard or softwood, whether green or dry.

The branches of trees and hedges are cut cleanly, without shredding or crushing. This technique limits any development of plant ailments and encourages healthy vegetation regrowth.

Only use cutting equipment (blades) recommended by SPEARHEAD MACHINERY.

The Saw Head fits onto the end of an articulated arm (bank mowers, excavators, telescopic lifters, etc. that will henceforth be referred to as carrier vehicles), and the working area is adjusted using hydraulic cylinders located on the arms.

Any other use is prohibited. The manufacturer declines any liability in case of damage resulting from non compliant use. Always observe the maintenance and servicing measures set out in this manual.

The Saw Head user is responsible should an accident occur of if any damage is caused to third parties or to property belonging to third parties.

Using the Saw Head for mowing or brush cutting is absolutely prohibited.

Working with the Saw Head when travelling in reverse is absolutely prohibited.

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3 Symbols And Decals

3.1 Symbol Definitions Found In This Manual

The following symbols are used in this manual to draw attention to specific hazards.

Warning.
These symbols warn of specific hazards.

Prohibited. These symbols show actions that are prohibited.

Protective gloves must always be worn.

Protective footwear must always be worn.

A worksite helmet must be worn.

Wearing a worksite helmet, ear defenders and protective goggles is required.

Figure 1

3.2 Decal Definitions Affixed To The Saw Head

The following decals are affixed to the Saw Head to warn of specific hazards.

Flying Debris Warning!
Objects and debris are likely to be projected. Keep a safe distance around the saw head.

Wearing a worksite helmet, ear defenders and protective goggles is required.

Cutting Hazard!
The blades are cutting tools.
Caution! When handling them and when cutting.

Cutting Hazard!
The cutting blades are cutting tools.

Caution! When handling them and when cutting.

Anchor point for handling.

Figure 2

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4 Serial Plate

4.1 Machine Identification

Each Saw Head is equipped with a serial plate; see Figure 3 that includes the following data in this order:

1. UKCA Conformity Marking.
2. Machine Whole Goods Code (WGC).
3. Serial number of the machine.
4. Mass in kg.
5. Production Year (year of construction).
6. Design conformity standard.
7. Machine Product Group Code.
8. EU Authorised Representative QR scan code.
9. Manufacturer marking with name and address.
10. EAC Eurasian/Russian Conformity Marking.
11. EC European Conformity Marking.

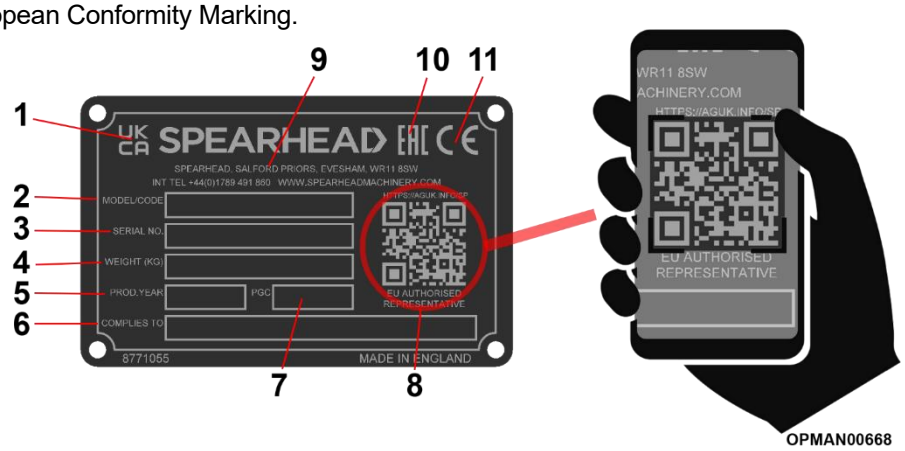

Figure 3 – Serial Plate

Data on the Spearhead manufacturer's plate should always be referred to when requesting assistance and/or requiring replacement spare parts.

This data can identify the Saw Head and its characteristics and specification for its particular time of manufacture, certifying that it responds to current regulations. For this reason the plate should never therefore be removed nor be used for other purposes; if the Saw Head is dismantled, it should be destroyed to prevent any form of abuse.

By utilising a smart phone and scanning the Authorised Representative QR scan code found on the right-hand side of the serial plate (ref 8, Figure 3) using a suitable QR scanning App, you can find details for Spearhead Machinery authorised representatives for its various territories.

The serial plate is located on the top of the Saw Head near the motor; see Figure 4.

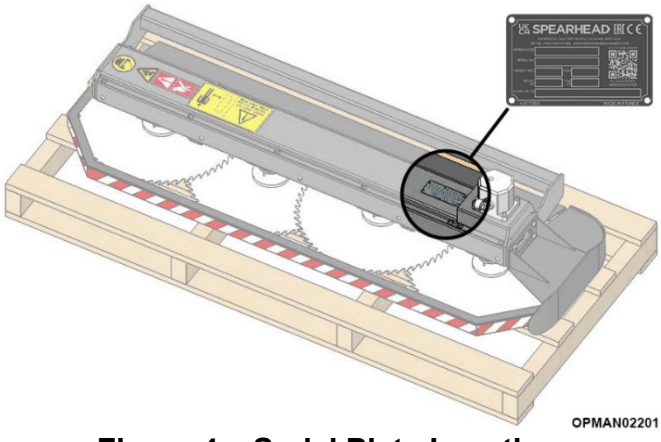

Figure 4 – Serial Plate Location

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5 Safety Instructions

5.1 General Safety Instructions

Operating this machine is strictly reserved for personnel who are trained and designated by name.

5.2 Prior Inspection Of The Machine

5.2.1.1 Always check that the equipment is properly mounted on the carrier arm.
5.2.1.2 Always check the condition of the cutting tools and and sharpen or replace them as required.
5.2.1.3 Always check that the cover and protective casings are properly attached.
5.2.1.4 Always ensure that all safety decals are present on the machine, are legible and clean and replace them if necessary.
5.2.1.5 Always check the condition of hydraulic hoses and ensure that there are no leaks.
5.2.1.6 Always check that related components are greased.

5.3 Prior Inspection Of The Work Area

5.3.1.1 Always inspect the work area to check for the possible presence of wire, metal posts, large stones, bottles and other dangerous objects. Remove these objects before starting work. Also lift up broken or damaged branches before starting work to prune branches.

5.3.1.2 Always note the presence of raised obstacles, particularly electrical cables: in this case, always determine the category of cable, notify the driver, and check the instructions:

- For power lines of less than 50 kV, the minimum working distance to respect is 3 metres.
- For power lines of more than 50 kV, the minimum working distance to respect is 5 metres.

See local regulations in force.

5.4 Ground Operating Conditions

The kind of ground that the carrier can operate on is of great importance as regards stability and safety: wet ground, bare earth, grass, leaves, steel plates must all be taken into consideration especially when working on ground that is sloping or inclined.

It is essential to pay attention to the maximum slopes or inclines allowed as stated in the carrier instructions.

Failure to pay attention to these instructions may cause the carrier to tip over.

5.5 General Operating Instructions

5.5.1.1 Always keep third parties away from the machine during operations to mount or unmount the Saw Head on the carrier. During these operations, define a safety perimeter of 10 metres around the machine in case it should overturn.
5.5.1.2 Always keep people away from the machine during cutting operations and create a safety perimeter of 100 metres around the machine in case branches fall or are ejected.
5.5.1.3 Place warning markings sign posting that tree cutting is in progress, in line with the applicable rules for marking off hazardous worksites.
5.5.1.4 Always inform worksite staff of any safety areas to be complied with.
5.5.1.5 Always ensure that personnel dedicated to picking up fallen branches or other wear suitable personal protective equipment and not remain within a 50 meter perimeter around the cutting tool and 100 metres in the direction that the blades are pointing in (both ahead and behind it).
5.5.1.6 Always ensure that people gathering branches and other objects respect and ensure that others respect the safety perimeter.
5.5.1.7 Always keep the carrier stable when cutting.
5.5.1.8 Always stop the rotating blades before carrying out any manoeuvres not related to cutting: carrier arm movements, reversing, positioning the saw head, etc.
5.5.1.9 Always call on someone on the ground to watch over movement, with the blades stopped, if the operator's visibility is reduced.
5.5.1.10 Always adapt the machine's forward motion speed to the condition of the terrain that the carrier is operating on.
5.5.1.11 Always fit the protective cover over the blades as soon as the work ends or as soon as the carrier stops.
5.5.1.12 Always clean the cutting equipment at the end of each working day: remove branches, leaves and any accumulation of sawdust.
5.5.1.13 Always fold the cutting equipment to the transport position after saw head shutdown and when moving it away from the work area.

Whenever reverse motion is required, always stop saw head rotation.

5.6 Site Safety Instructions

When working with cutting equipment, there are projection hazards, a risk of falling branches or flying debris, especially in front of and behind the saw head.

To avoid these risks, it is necessary to stop anyone from entering the safety zone, this being a circle with radius of 100 metres around the carrier.

Pedestrians, cyclists, site personnel:
5.6.1.1 For site personnel, always wear personal protective equipment (helmet, gloves, glasses etc.), the safety zone can be reduced to a 50 metre radius.
5.6.1.2 Excluding site personnel, it is necessary to ensure that no other people (pedestrians, cyclists etc.) are within an area with a radius of 100 metres around the carrier.

If people enter the zone, the operator must stop working momentarily to allow enough time for these people to leave this zone.

Other vehicles:
5.6.1.3 Other vehicles passing through the safety zone is strictly prohibited while cutting is in progress.
5.6.1.4 During the manoeuvre phases, please mark off a travel area located 1.50 metres away from the outer edge of the wheels.

If the width of the road does not allow it, it is essential for the operator to stop when meeting oncoming traffic.

Buildings alongside the site:

5.6.1.5 When buildings are inside the safety zone, inform residents of cutting operations and, for their safety, of the need to remain indoors, to close windows and shutters and to not leave the building in order to avoid any harm linked to potential flying debris.

5.7 Maintenance Instructions

5.7.1.1 Always position the carrier vehicle and cutting machine on flat, stable ground in an open environment to carry out any maintenance operations.
5.7.1.2 Always wear personal protective equipment for maintenance operations: Gloves, safety shoes, safety glasses.
5.7.1.3 Always cut the power from the carrier vehicle and activate the parking brake before carrying out any work on the cutting equipment: Switch off the carrier's engine.
5.7.1.4 Always respect all general safety standards in addition to the recommendations given in this manual.
5.7.1.5 Always use a specialist technician to carry out any maintenance operations other than those described in this manual.
5.7.1.6 Always keep the blades in good, sharp condition and properly set. Replace a blade as soon as you see any cracking appear at the base of a saw tooth.
5.7.1.7 Always check that the nuts and bolts on the cutting equipment are securely screwed in before each use.
5.7.1.8 Always be very careful to follow the procedures described in the manual dismounting and mounting the cutting blade.
5.7.1.9 Always clean the cutting equipment fully at the end of each working day.
5.7.1.10 Always replace worn or defective parts with original SPEARHEAD parts.

5.8 Warnings

5.8.1.1 Never allow non-accredited or untrained people to use this cutting equipment.
5.8.1.2 Never use this cutting equipment or carrier vehicle under the influence of alcohol or drugs.
5.8.1.3 Never use the machine during strong winds: maximum: 40 km/h.
5.8.1.4 Never use the cutting equipment during a storm: risk of lightning.
5.8.1.5 Never use the cutting equipment at night, nor if light levels do not allow the operator to clearly see the end of the cutting tool.
5.8.1.6 Never use the machine without setting out the site markings.
5.8.1.7 Never stand below the cutting component regardless of its height.
5.8.1.8 Never cut large branches using the saw head when the blades are not parallel to the direction of carrier motion or to the cutting direction.
5.8.1.9 Never cut branches larger that the dimensions recommended in this manual; see "Technical Specifications", Section 6.2.
5.8.1.10 Never continue using the cutting equipment when a wire or similar wire objects have wound themselves around a disk.
5.8.1.11 Never use a blade that no longer cuts.
5.8.1.12 Never overhang a traffic zone without having first stopped access.
5.8.1.13 Never travel along the road without having first installed the blade covers.
5.8.1.14 Never carry out maintenance operations not described in this manual.
5.8.1.15 Never use spare parts that do not originate from SPEARHEAD.
5.8.1.16 Never use the cutting equipment as lifting equipment for people or objects.
5.8.1.17 Never use the Saw Head tip to push cut branches.
5.8.1.18 Never leave the circular saw blades rotating during manoeuvres with the carrier when not cutting (changing road, reversing, changing carrier direction, etc.)

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6 Equipment Description

6.1 Component Locations

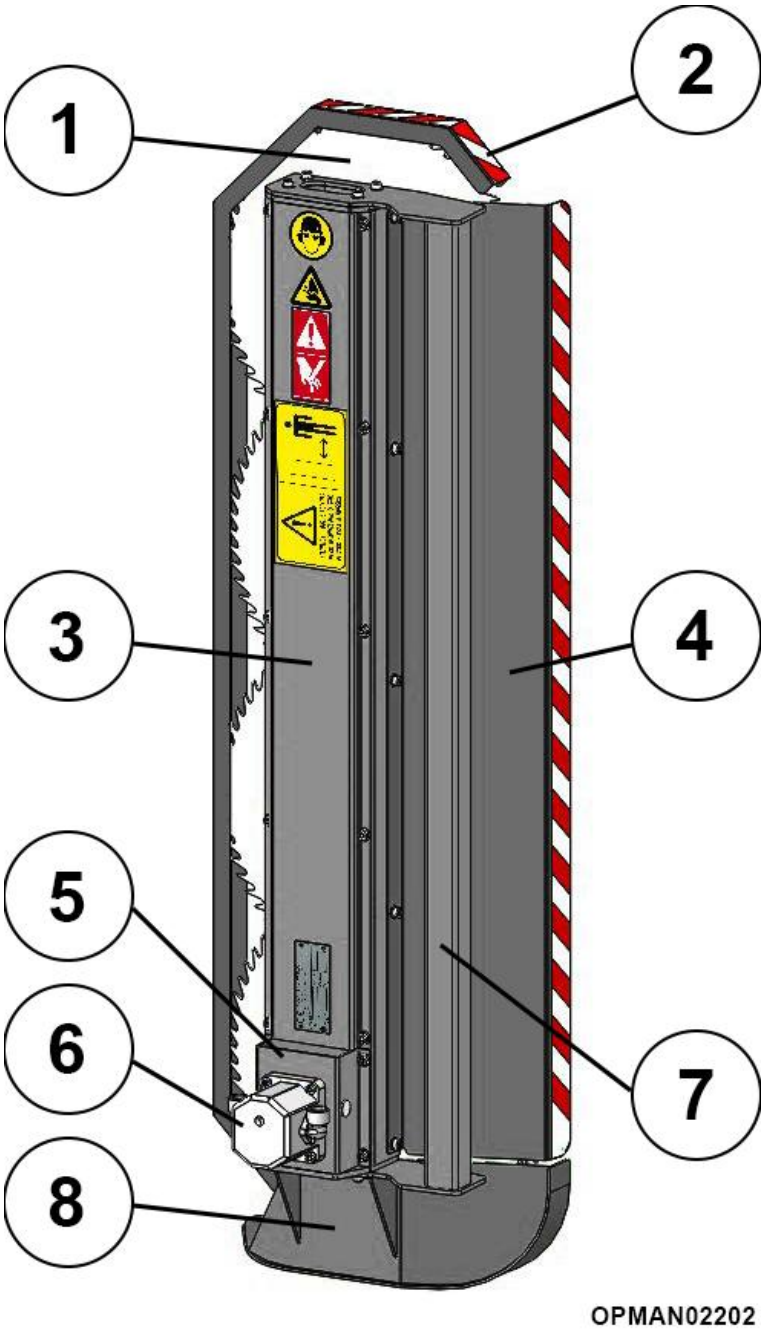

Figure 5 – Saw Head Main Components

Item No.	Description.
1	Circular Saw Blade
2	Blade Cover
3	Cover
4	Rear Protective Casing
5	Motor Dome
6	Hydraulic Motor
7	Support Tube
8	Shoe

Table 1

6.2 Technical Specifications

Model		**SP15**
Number Of Blades		4
Dimensions And Weight		
Weight (kg)		88
Overall Width (mm)	A	1622
Overall Length (mm)	B	535
Overall Height (mm)	C	365
Cut Width (mm)	Lc	1595
Position Of Centre Of Gravity (in relation to the underside and the rear of the mounting tube)	X	200
	Y	45
	Z	580

Table 2

Model		**SP15**
Hydraulic Motor		
Type		Gear
Displacement (cm³)		14.4
Required Flow Rate (l/min)		36
Max. Pressure (bar)		140
Rotation Speed (rpm)		2500
Motor Filtration (mm)		10
Max. Pressure On The Drain (bar)		2
Drive		Poly V Belt With 5 Grooves
Transmittable Power (kW)		9.2
Diameter		500
Number Of Teeth		96
Thickness		3
Cutting Capacity (mm)	Stopped (ref Figure 6, C1)	up to Ø150
	Moving Forward (ref Figure 6, C2)	up to Ø80

Table 3

It is essential that the flexible drain hose be connected directly to the carrier's hydraulic fluid reservoir.

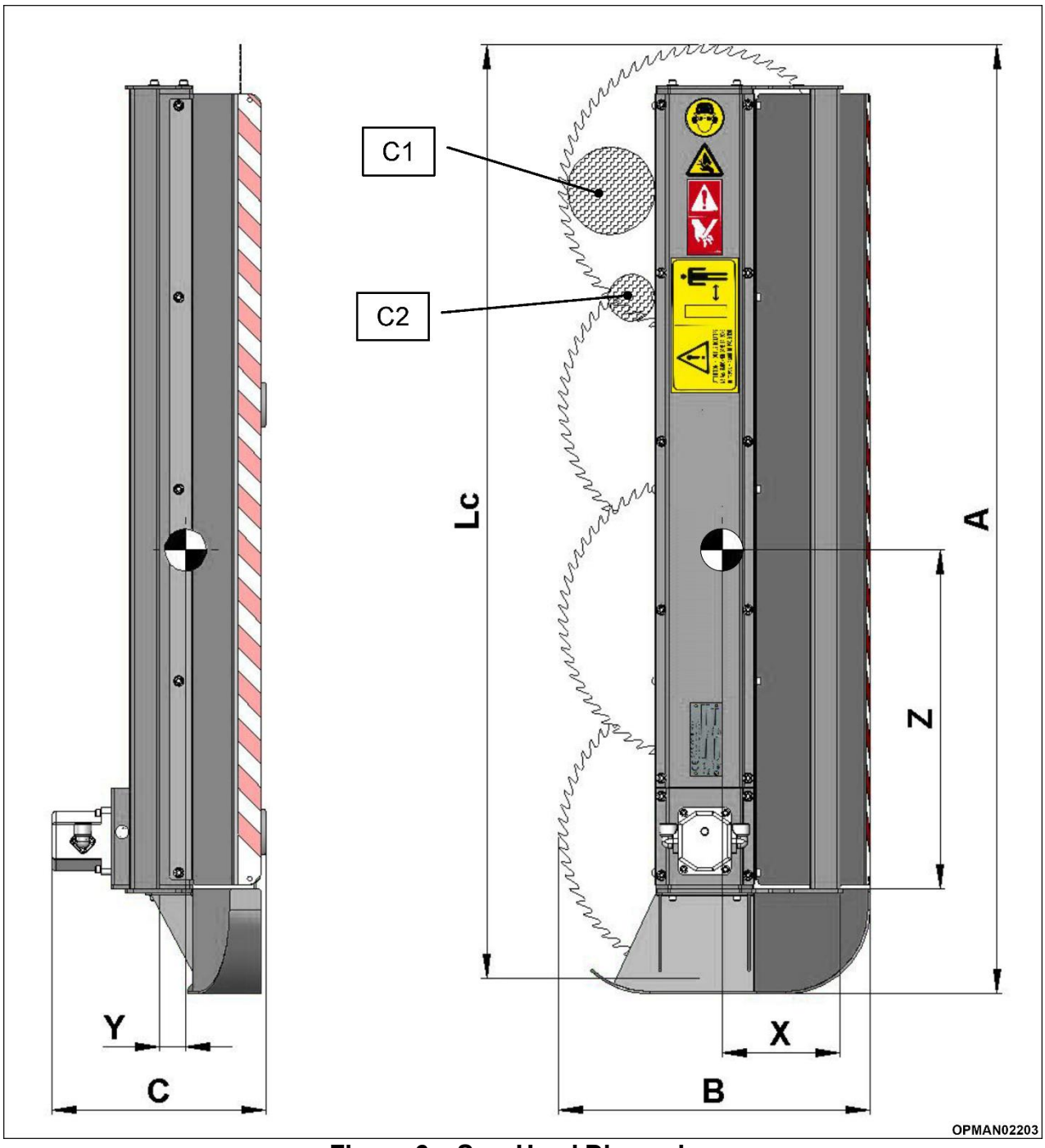

Figure 6 – Saw Head Dimensions

For Saw Heads with gear motors:

- If the maximum pressure produced by the motor driving the saw head exceeds the values shown in this table, it is essential to install a pressure limiter set to the correct value or ask your dealer for the relevant kit.
- In the same way, if the flow rate produced by the carrier to supply the saw head motor exceeds the values shown in this table and cannot be adjusted, then it is essential to install a flow rate regulator on the motor.
- The saw head motor can run in both directions.

However, if a pressure limiter or a flow rate regulator are mounted on the saw head motor, then it will only run in one rotation direction.

6.3 Airborne Noise

The airborne noise produced by the carrier + cutting equipment, with the saw head rotating, was measured under the following conditions:

- Carrier engine running at 1500 rpm so that the flow rate obtained is suitable for the saw head.
- Saw head equipped with circular saw blades
- Carrier stopped on flat terrain
- Windows and doors closed

Measurement made in the cab, in the driving position: **84.5 dB**
Measurement made 10 metres from the carrier: **99 dB**

This measurement was made with new blades and the saw head under no load. When the blades cut branches they make less noise.

Nevertheless, everyone working near the machine (picking up branches), must wear ear defenders.

The values below are provided as an indication only.
They may vary depending on the make of the carrier and the engine speed needed to obtain the necessary flow rate.

7 Components Included In The Delivery

The saw head is delivered boxed, on a pallet. You should find the following components:

- The saw head
- This user's and maintenance manual
- Hydraulic hoses
- A set of tools:
    - A tightening wrench for fitting/removing the cutting tools
    - A holding wrench
    - A 5/32 Allen wrench
    - Two Allen M8x16 screws

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8 Installing The Saw Head And The Cutting Tools

8.1 Handling The Saw Head

If the saw head needs to be completely removed from its carrier, make slinging on 3 points to move it securely; see Figure 7.

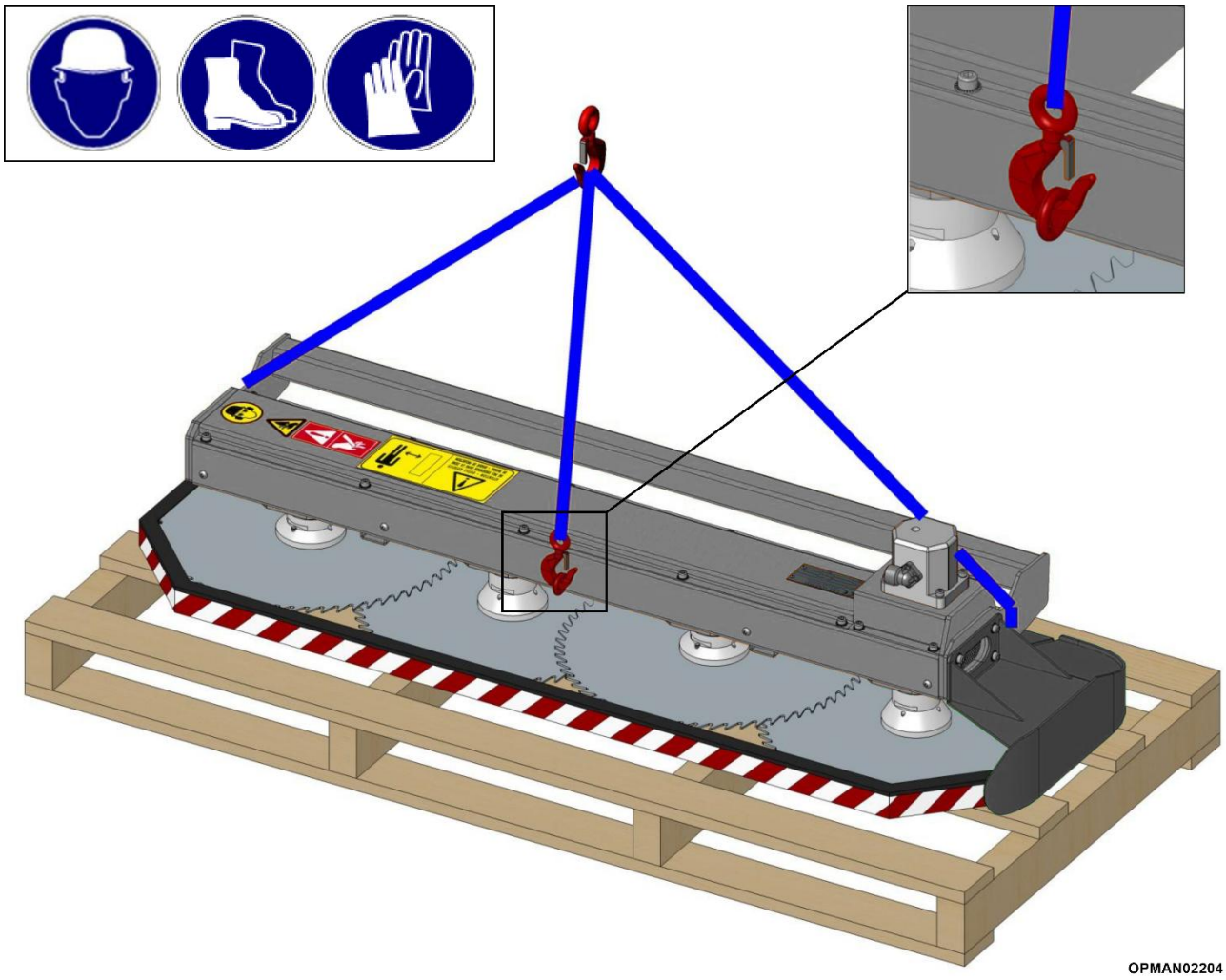

Figure 7

Use approved lifting equipment (straps, chains, hoist) taking care to abide by their rules for use and with a lifting weight capacity that matches the weight of the saw head; see "Technical Specifications", Section 6.2.

The saw head must be equipped with its blade casing during all handling and moving operations.

If the saw head needs to be moved or mounted vertically, sling the saw head as described below; see Figure 8.

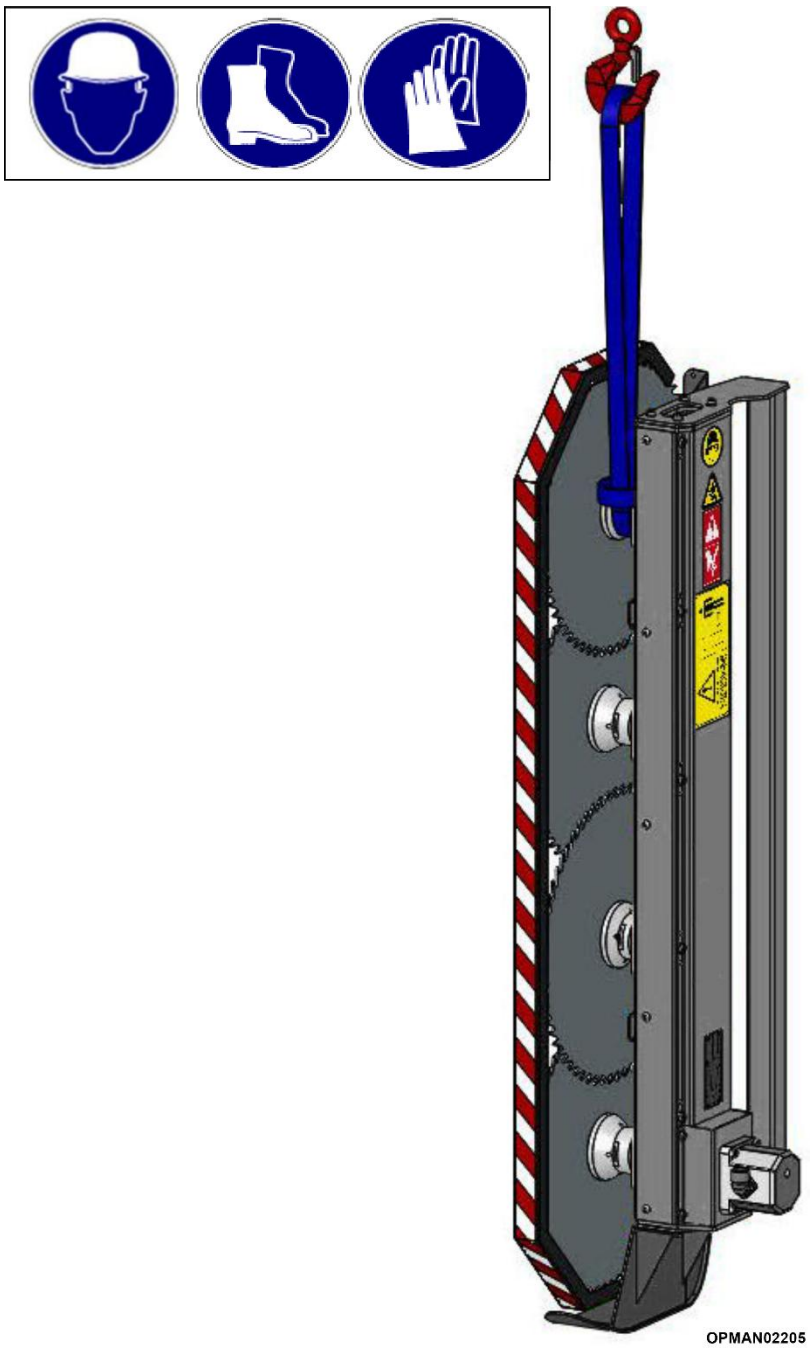

Figure 8

8.2 Mounting The Saw Head On A Carrier

8.2.1 Carrier Arm Suitability

Before installing the saw head on the carrier vehicle arm, it is essential to ensure that the carrier arm and the carrier vehicle are heavy enough and have sufficient capacity to bear the weight of the saw head with the coupling parts and to guarantee their stability while working in complete safety.

The weight of the saw head alone is shown on the serial plate attached to the cover; see "Serial Plate", Section 4 and "Technical Specifications", Section 6.2.

It is necessary to add the weight of the various mechanical coupling parts to reach the full weight on the end of the carrier arm.

8.2.2 Mechanical Coupling

The saw head can be mounted on a variety of carrier types and models. To mechanically couple the saw head with your carrier, there is a 70mm square support tube to allow for the universal fitment of the saw head to compatible carrier vehicle arms. Don't hesitate to ask your dealer for advice.

Figure 9

With reference to Figure 10, proceed as follows:

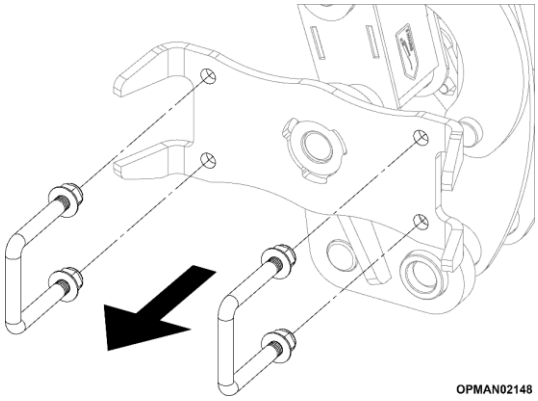

Figure 10

8.2.2.1 Place the saw head on a stable horizontal surface (ground or pallet).
8.2.2.2 On the carrier arm, remove the pair of U bolts and nuts from the carrier clamp bracket; see Figure 10.
8.2.2.3 Position each of the four U bolts in front of the box section on the saw head.
8.2.2.4 Carefully bring the tractor and carrier arm to the saw head positioning the carrier arm:

- So the jaws of the clamping bracket line up either side of the 70mm (2 3/4”) box support tube mounting point on the saw head.
- So the U bolts are placed centrally in the width of the saw head. To unmount the saw head, follow the above instructions in reverse order.

8.2.2.5 Switch off the tractor and apply the handbrake.

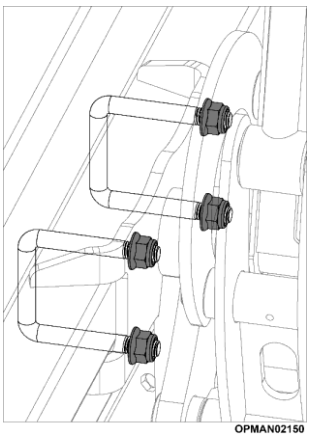

Figure 11

8.2.2.6 Fit the U bolt nuts; see Figure 11.
8.2.2.7 Gradually tighten up each of the four fasteners in a cross pattern to pull in and fully secure the saw head to the carrier arm.
8.2.2.8 Proceed to connect the hydraulic hoses.
8.2.2.9 To unmount the saw head, follow the above instructions in reverse order.

8.2.3 Hydraulic Connection

The Spearhead Quadsaw saw balde may require a selection of hydraulic fittings to create a successful hydraulic connection to the carrier arm.

Figure 12

With reference to Figure 13, proceed as follows:
8.2.3.1 Switch off the carrier vehicle engine, apply the handbrake and remove the ignition key.
8.2.3.2 Check that there is no pressure in the hydraulic system.
8.2.3.3 Connect the pipes (A) and (B) to supply the motor (a pressure and a return line).
8.2.3.4 Connect pipe (C) to drain the motor.

It is essential for the engine drain line to be a direct return to the tank; see "Technical Specifications", Section 6.2.

8.2.3.5 To disconnect the pipes, follow the above instructions in reverse order.

If your equipment is not equipped for the hydraulic motor to run in both directions, pay attention to the respective positions of the pressure and return lines (A) and (B) so that the cutting blades will turn in the right direction to ensure a quality cut; see "Choosing The Cutting Tool Rotation Direction", Section 9.8.

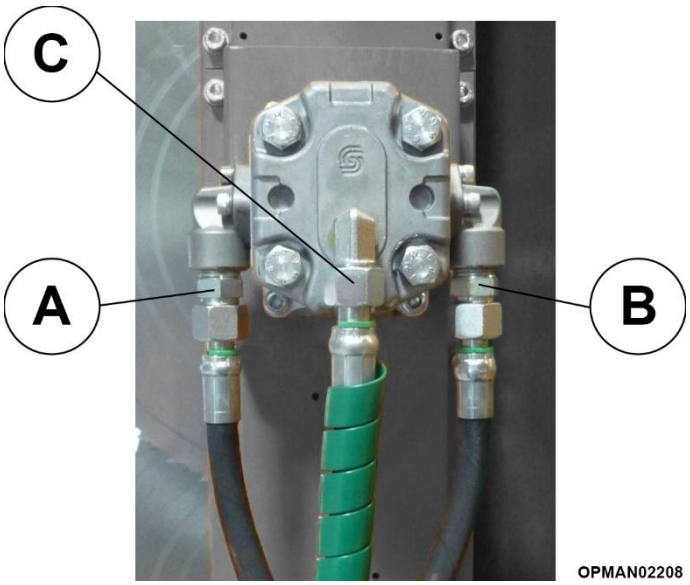

Figure 13

8.3 Saw Blade

8.3.1 Saw Blades Blade Height Positions

Blade bearing mounting sequence:

With reference to Figure 14, always place a short offset blade bearing at the top end of the saw head (SO) (opposite end to the motor).

Machine	SO Short Offset Quantity	LO Long Offset Quantity
	See Figure 14	
SP15 Quadsaw	2	2

Table 4

Figure 14

Properly choosing your cutting tool and correctly maintaining it is essential to ensure quality work, and especially to ensure your safety and that of others.

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9 Using The Saw Head

9.1 Moving The Carrier With The Saw Head In Place

When moving along roads, the carrier arm and the saw head must be folded. The blade protective casing must be placed over the cutting tools.

9.2 Marking Off The Work Site

Before starting to trim branches, always mark off the work area in line with applicable regulations, to prohibit entry into it and to avoid any possible accidents.

See "General Operating Instructions", Section 5.5.

9.3 Inspect The Work Area

Before starting to trim branches:

9.3.1.1 Check the ground condition and ensure that there are no foreign objects in the hedge or in the trees; see "Prior Inspection Of The Work Area", Section 5.3.

9.3.1.2 Record the location of any pole and obstacles.

9.3.1.3 Check the size of the branches to be cut (their diameter) to use the correct cutting ; see "Technical Specifications", Section 6.2.

9.4 Restate The Safety Instructions To The Site Personnel

See "Safety Instructions", Section 5:

9.4.1.1 Wearing Personal Protective Equipment (PPE)

9.4.1.2 Compliance with safety distances

9.4.1.3 Make sure that the safety perimeter is complied with

9.5 Choosing The Fixing Position Of The Carrier Arm On The Saw Head

In principle, the carrier arm is mounted on the saw head supporting tube opposite the motor drive. In certain special cases however, it may be advantageous to change the saw head position; see "Adjusting The Carrier Arm Fixing Position", Section 12.8.

Check carrier stability, especially with the saw head in the horizontal position.

9.6 Starting The Saw Head

9.6.1.1 Before starting the saw head, make sure that all of the safety rules are applied and complied with; see "Safety Instructions", Section 5.

9.6.1.2 Remove the blade protection casing

9.6.1.3 Check one last time that nobody is present nearby.

9.6.1.4 Start the carrier, with the engine at idle.

9.6.1.5 Place the carrier and the saw head in the desired position.

9.6.1.6 Start the saw head and leave the transmission to run and the oil to circulate for five minutes.

9.6.1.7 Slowly move forward into the working area.

9.7 Working With The Saw Head

9.7.1.1 Start the saw head as described in the previous chapter.
9.7.1.2 Increase the carrier's engine speed to the value recorded during calibration; see "Adjusting The Rotation Speed Of The Blades", Section 12.7.
9.7.1.3 Position the saw head close to the hedge or branches to cut and move forward at low speed during cutting.
9.7.1.4 Never change the angle of the saw head during cutting through large branches. This could jam the blades and damage them.
9.7.1.5 Avoid running the carrier vehicle over a rough path of holes and rocks. This may well cause the end of the carrier arm, that the saw head is mounted on, to oscillate severely.

9.8 Choosing The Cutting Tool Rotation Direction

With reference to Figure 15:
9.8.1.1 When performing a vertical cut, the blades must cut upwards to achieve better cutting quality (DIRECTION 1).
9.8.1.2 However, to minimise the wood cuttings given off, it is preferable to have the cutting tool set to turn downwards (DIRECTION 2).

Note: The saw blade only cuts in one direction. Make sure that it is fitted in the right direction in relation to the required rotation direction; see Figure 15.

9.8.1.3 When cutting horizontally, the blades must turn so that any debris is projected away from the user.

We recommend enclosing the carrier cab so that the operator is protected from any debris and falling branches.

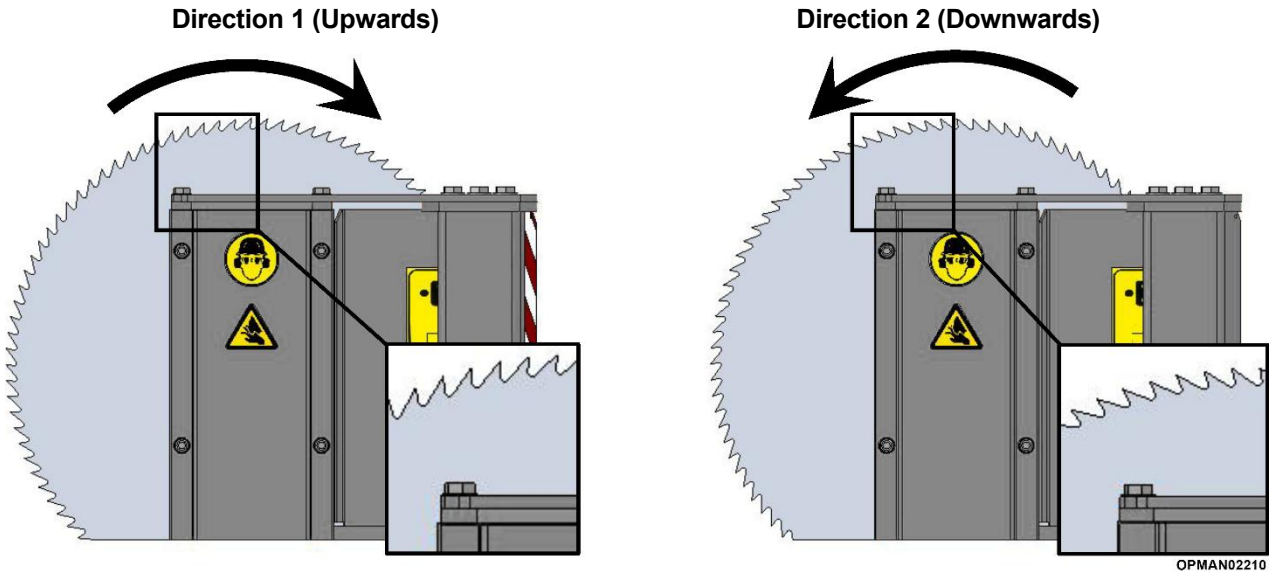

Figure 15

9.9 Choosing The Forward Speed When Working

The carrier's forward speed during cutting work depends on a variety of parameters:
9.9.1.1 Characteristics of the ground that the carrier can operate on
9.9.1.2 Working height
9.9.1.3 Density of the vegetation to cut
9.9.1.4 Thickness of the branches to cut

You need to choose the right speed for every situation.
We recommend a forward speed of 0 to 1 kilometre per hour (0.62 mph) along the work site.

Furthermore, on rougher terrain, we recommend working at a slower speed both to ensure carrier stability and to ensure that the cutting result meets your expectations.

9.10 Driving Recommendations

9.10.1.1 During the work, we recommend that as the carrier moves forward, take the following precautions once the blades are engaged in the branches:

- Keep the tractor on the right path.
- Do not make any offset or height corrections with the saw head.
- Adjust the speed to the size of the branches.

9.10.1.2 It is preferable to start work from the bottom. This way vegetation falls along the cutting line.

9.10.1.3 To cut through large branches, keep the carrier as far away as possible and cut the branches into a number of pieces.

Reminder of the usage prescriptions:

Using the Saw Head for mowing or brush cutting is absolutely prohibited.

Working at night or when the light does not allow the operator to clearly see the saw head is absolutely prohibited.

Stop cutting tool rotation during any manoeuvres that do not involve cutting operations and also when reversing.

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10 Undesirable Events

During cutting work you may be faced with various situations that may trigger poor cutting equipment operation or its blockage.

10.1 Trapping Branches In The Saw Head

Figure 16

10.1.1.1 Stop saw head rotation.
10.1.1.2 Place the saw head tip in its vertical position, on flat, stable and clear ground.
10.1.1.3 Switch off the carrier vehicle engine, apply the handbrake and remove the ignition key.
10.1.1.4 Put on personal protective equipment: gloves, goggles and safety boots.
10.1.1.5 Remove any trapped branches by hand by turning the blades (by hand) where necessary.

10.2 Stalling The Saw Blade Due To A Thick Branch

Figure 17

10.2.1.1 Stop carrier motion or the cutting action.
10.2.1.2 Reduce the carrier engine speed back to idle.
10.2.1.3 Cut the hydraulic supply to the saw head.
10.2.1.4 Reverse the carrier or perform the reverse cutting motion.
10.2.1.5 Once the blade is clear, restart the saw head motor.
10.2.1.6 Accelerate the carrier engine back up to the engine speed recorded during saw head calibration; see "Adjusting The Rotation Speed Of The Blades", Section 12.7.

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11 Finishing Work

11.1 Stopping Work

Figure 18

As soon as you stop cutting or trimming work:

11.1.1.1 Stop saw head rotation.
11.1.1.2 Place the saw head at person height.
11.1.1.3 Fit the blade protective housing into position.
11.1.1.4 Clean the cutting equipment. Remove any branches and twigs caught in the various channels.
11.1.1.5 Fold the cutting equipment into its transportation position.

11.2 Unmounting The Saw Head

Figure 19

11.2.1.1 Check that the blade protective housing is in position.
11.2.1.2 Using the carrier arm and place the saw head onto a pallet on flat, stable ground with enough free space around it for easy access.
11.2.1.3 Disconnect the hydraulic hoses and the flexible drain hose.
11.2.1.4 Uncouple the saw head from the carrier arm; see "Mechanical Coupling", Section 8.2.2.
11.2.1.5 Slowly reverse the carrier.

11.3 Storing The Saw Head

11.3.1.1 The saw head should be stored on a flat and stable surface, in a dry place.
11.3.1.2 The blade protective housing (1) must be in position; see Figure 20.

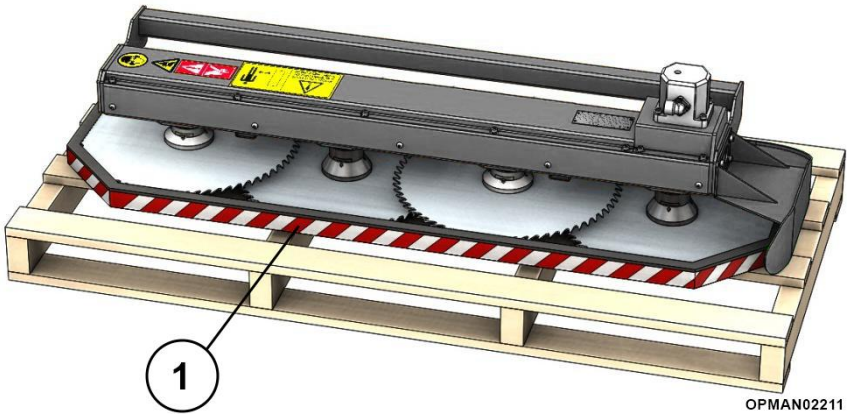

Figure 20

11.3.1.3 Before storing the saw head for an extended period it is important to fully clean the blade bearings.
11.3.1.4 Furthermore, we strongly recommend coating the two sides of the blades with a fine coat of storage oil using a small sprayer or a oiled cloth to protect them from corrosion.

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12 Servicing And Adjustments

12.1 Greasing

12.1.1 Initial Greasing

All of the saw head bearings are greased on assembly at the factory **for an initial 150 hours in service**.

Routine greasing is then required to maintain each of the saw head bearings correctly; see Section 12.1.2.

12.1.2 Routine Greasing Interval

Machine	Item.	Grease Point Quantity.	Interval.	Grease Quantity Required.	Grade.
SP15 Quadsaw	Saw Head Bearings; see Figure 21	x4	Every 100 operating hours	x3 manual grease gun pumps (18 grams)	IGOL Rally grease with synthesizing agents (420 gramme cartridge)

Table 5

Use the grease nipple provided for this purpose; see Figure 21.

It is recommended that greasing of the bearings should be carried out with the saw head in the vertical position.

Every time the blades are handled, removed and refitted, always grease the threads and the nuts on the plates; see "Mounting And Removing A Blade", Section 12.4.

Greasing Blade Bearings

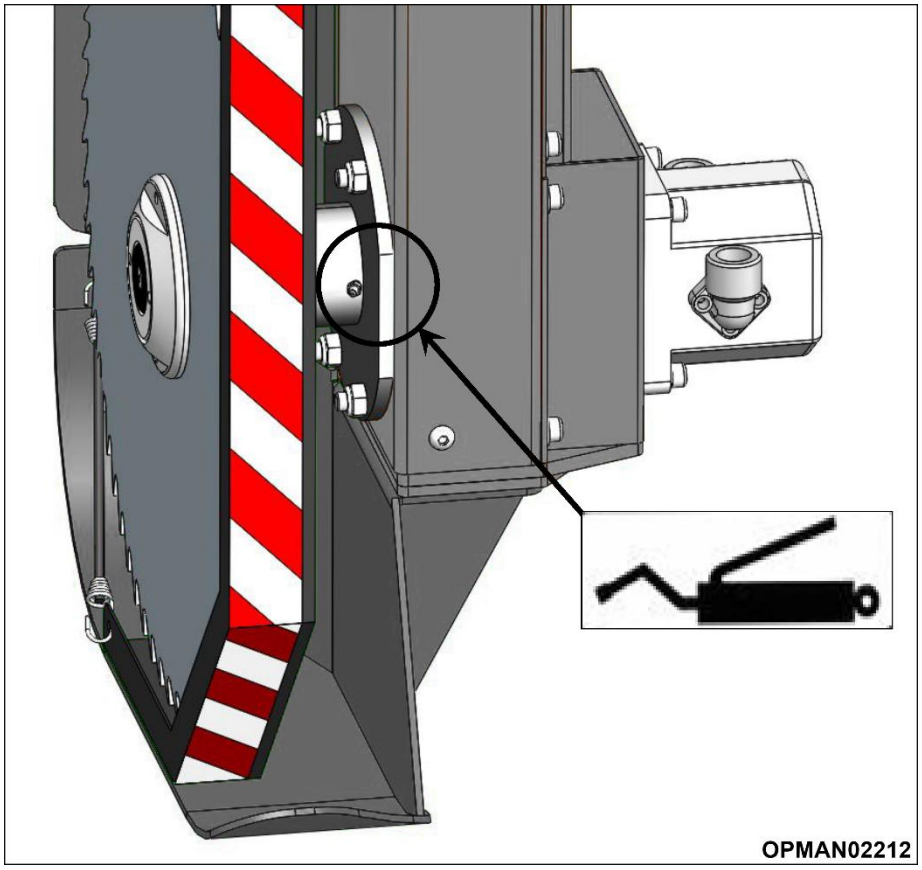


Figure 21

12.2 Fasteners

Item.	Nm.	Lbft
M8 Bolts	2.8	2.1
M10 Bolts	5.3	3.9
M24 X 150 Nut (Pulley Nut)	28	21
Blade Tightening Nut	28	21

Table 6

12.3 Saw Blades

Any handling of blades must be performed wearing gloves and the operator must wear safety footwear.

Figure 22

12.3.1 Maintenance Of The Saw Blades

Setting Saw Blades

Use the right blade according to the wood to be sawn:

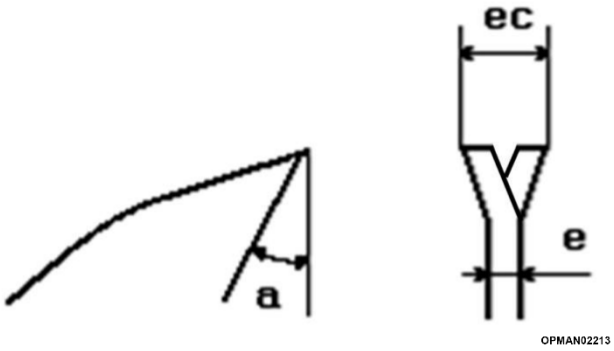


Figure 23

With reference to Figure 23:

Path and angle of attack greater for softwood:
a = 24 to 30°

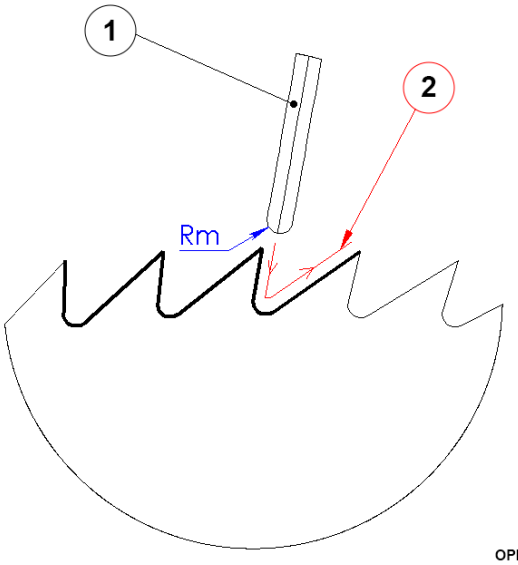
Path and angle of attack lower for hardwood:
a = 20 to 24°

Set: ec=2 x e

Note: The values that are given are average values that may be different in certain special cases.

Blades that are not properly maintained cut badly and damage the saw head transmission (belts).

Sharpening The Saw Blades



With reference to Figure 24:

Items
Item 1: Grinding Wheel
Item 2: Grinding Wheel Trajectory
Rm: Grinding Wheel Radius

The grinding wheel should do all around the teeth.

The radius of the grinding wheel (Rm), must match the root radius desired tooth.

Figure 24

Every Three Days During Normal Use.

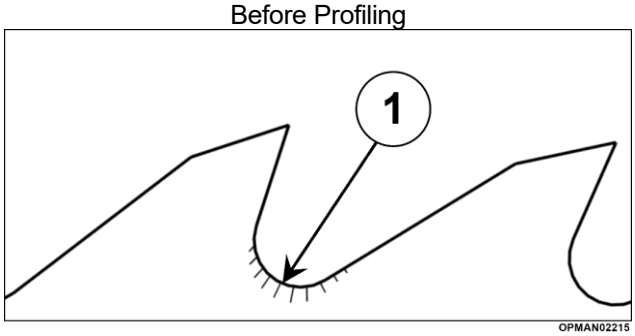
Frequent sharpening ensures that the saw blades:

- Retain their best working qualities as well as optimum working safety.
- Retain a high cutting capacity, allowing easy, straight cutting.
- Require less force during cutting, cause less fatigue of the saw blade, which retains its levelling and tension characteristics longer, while avoiding cracks.

Profiling

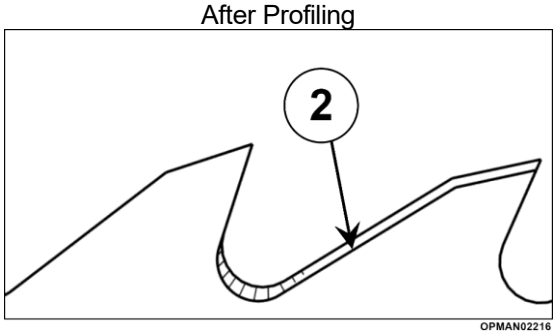
Before any setting, crushing or stellite tipping operation, make sure to shape the tooth profile on a grinder, through several light runs, to eliminate micro cracks around teeth caused by the cutting tool; see Figure 25 (1). If this precaution is not taken, teeth may be broken during setting or eroded during crushing, or saw blades may be cracked at the bottom of teeth during cutting.

Before Profiling



1 = Microcracks

After Profiling



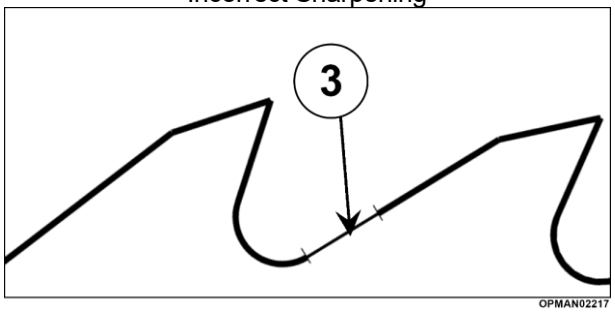
2 = New Profile

Figure 25

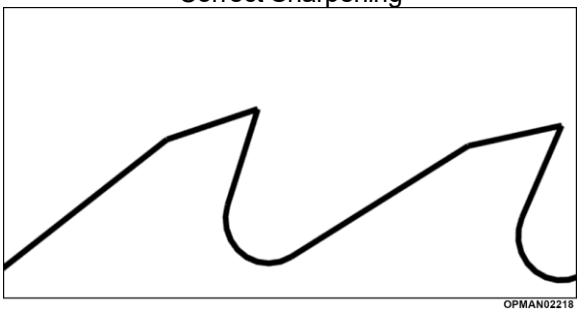
Sharpening

Stellite tipped saw blades come pre-sharpened, so it is recommended to work them for less time the first time the machine is used, before complete reshaping and sharpening through light runs. The cracks at the bottom of teeth are often caused by an incomplete profiling operation, with the grinding wheel not eliminating traces of metal fatigue at the bottom of teeth; see Figure 26 (3).

Incorrect Sharpening



Correct Sharpening

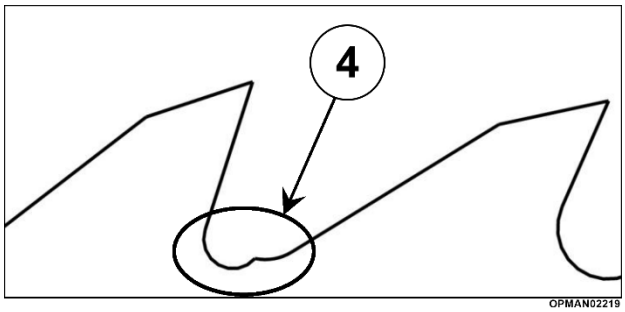


3 = Part Unground

Figure 26

Sharpening should not create any break in profile, hollowing, dents, or facets which weaken the saw blade's strength, and thus increase the risk of incipient cracks; see Figure 27 (4). Special attention thus needs to be paid to the tooth's smooth, rounded bottom, and its regularity. Grinding should be carried out using an appropriate grinding wheel in several runs to avoid burning the steel.

Uneven Profile, Risk Of Cracking



Tooth base with even well-rounded profile is more resistant

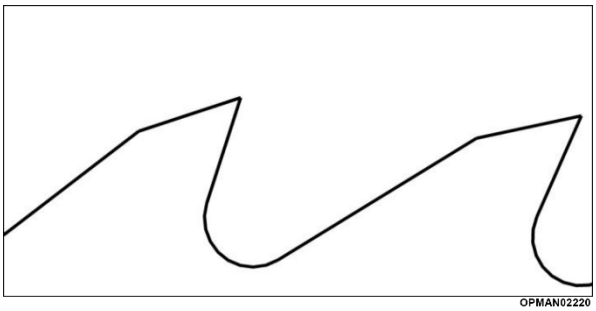


Figure 27

12.4 Mounting And Removing A Blade

Any handling of blades must be performed wearing gloves and the operatormust wear safety footwear.

Figure 28

Removing A Cutting Blade

With reference to Figure 30:

12.4.1.1 Put the holding wrench (1) in the notches (A) against the counter flange
12.4.1.2 Unscrew and remove the safety screw (2) using the Allen wrench (3).
12.4.1.3 Remove the safety washer (4).
12.4.1.4 Position the tightening wrench (5) in front of the holes drilled in the tightening nut (6) provided for this purpose.
12.4.1.5 Screw down the two screws (7) to hold the wrench (5) in position on the tightening nut (6).
12.4.1.6 Slacken the tightening nut (6) and remove it.
12.4.1.7 Remove the end shield (8)
12.4.1.8 Remove the cutting tool (9).

Fitting A Cutting Blade

12.4.1.9 Grease the threaded shaft (10) and the tightening nut (6).
12.4.1.10 Repeat the actions described in the previous step, in reverse order.

The tightening nut (6) should be tightened down to a torque of 28 nm/21 lbft.

Make sure the two screws (11) are mounted.

Refit the blades with their teeth in the same direction; see "Choosing The Cutting Tool Rotation Direction", Section 9.8.

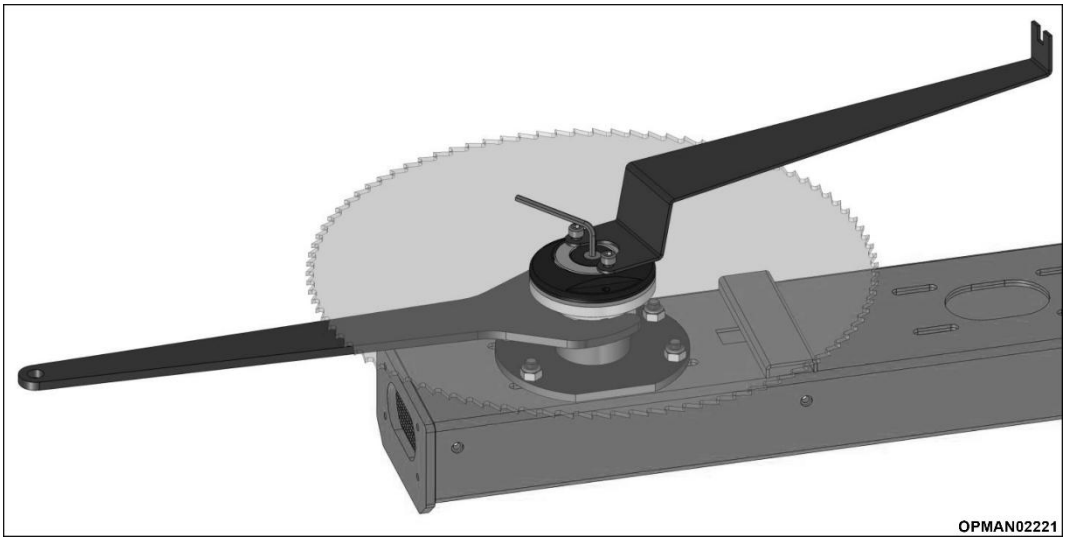


Figure 29

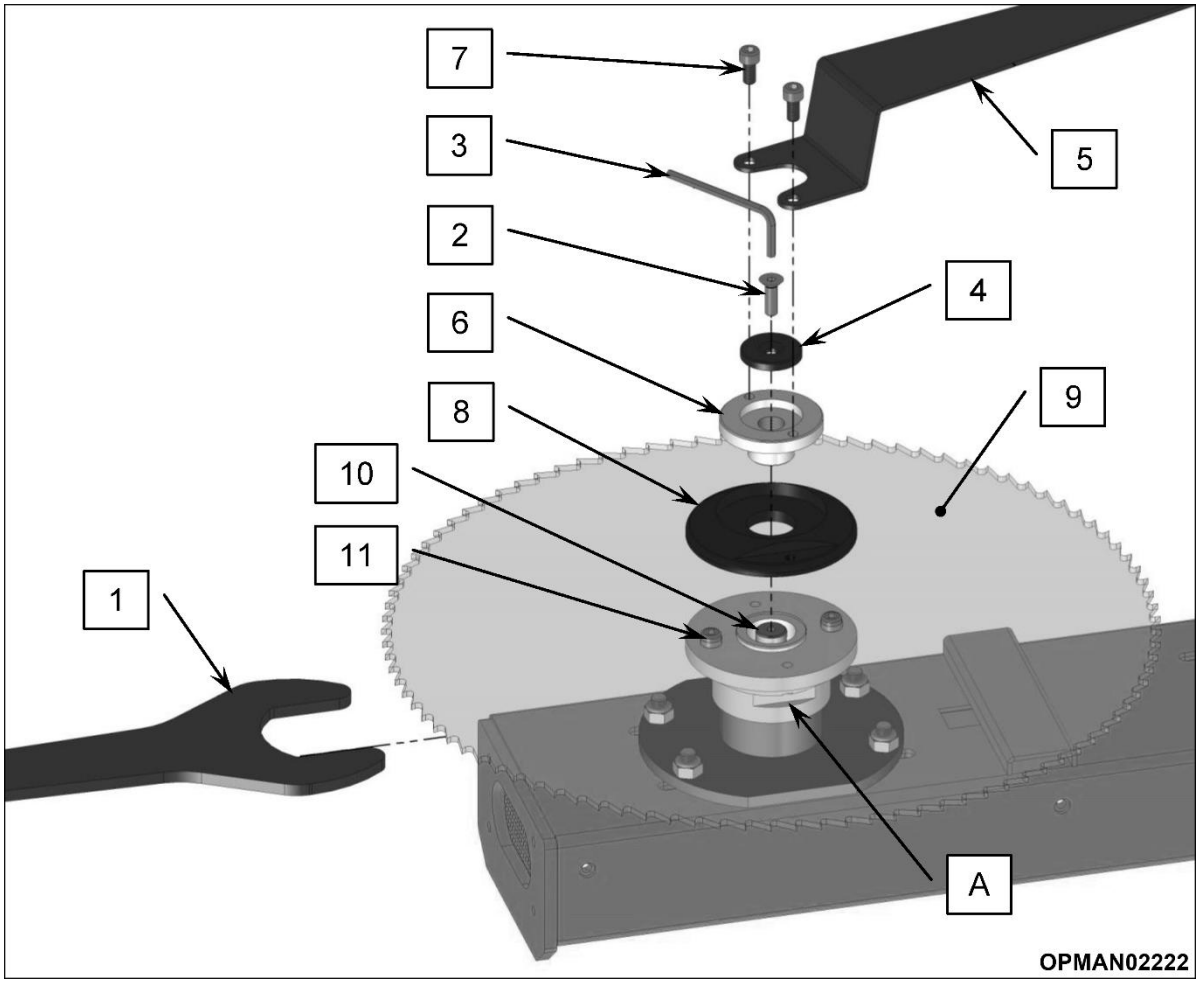


Figure 30

12.5 Belts

12.5.1 Tensioning The Belts

With reference to Figure 31:

12.5.1.1 Place the Saw Head in a horizontal position, on a base that touches the casing (1) and not the blades.
12.5.1.2 Switch off the carrier vehicle engine, apply the handbrake and remove the ignition key.
12.5.1.3 Remove the blades; see "Mounting And Removing A Blade", Section 12.4.
12.5.1.4 Unscrew the covers to access the transmission.
12.5.1.5 Slightly slack all of the screws (2) on the blade bearings (3), except for those on the motor bearing (4). Leave end play of 1 to 2 mm.

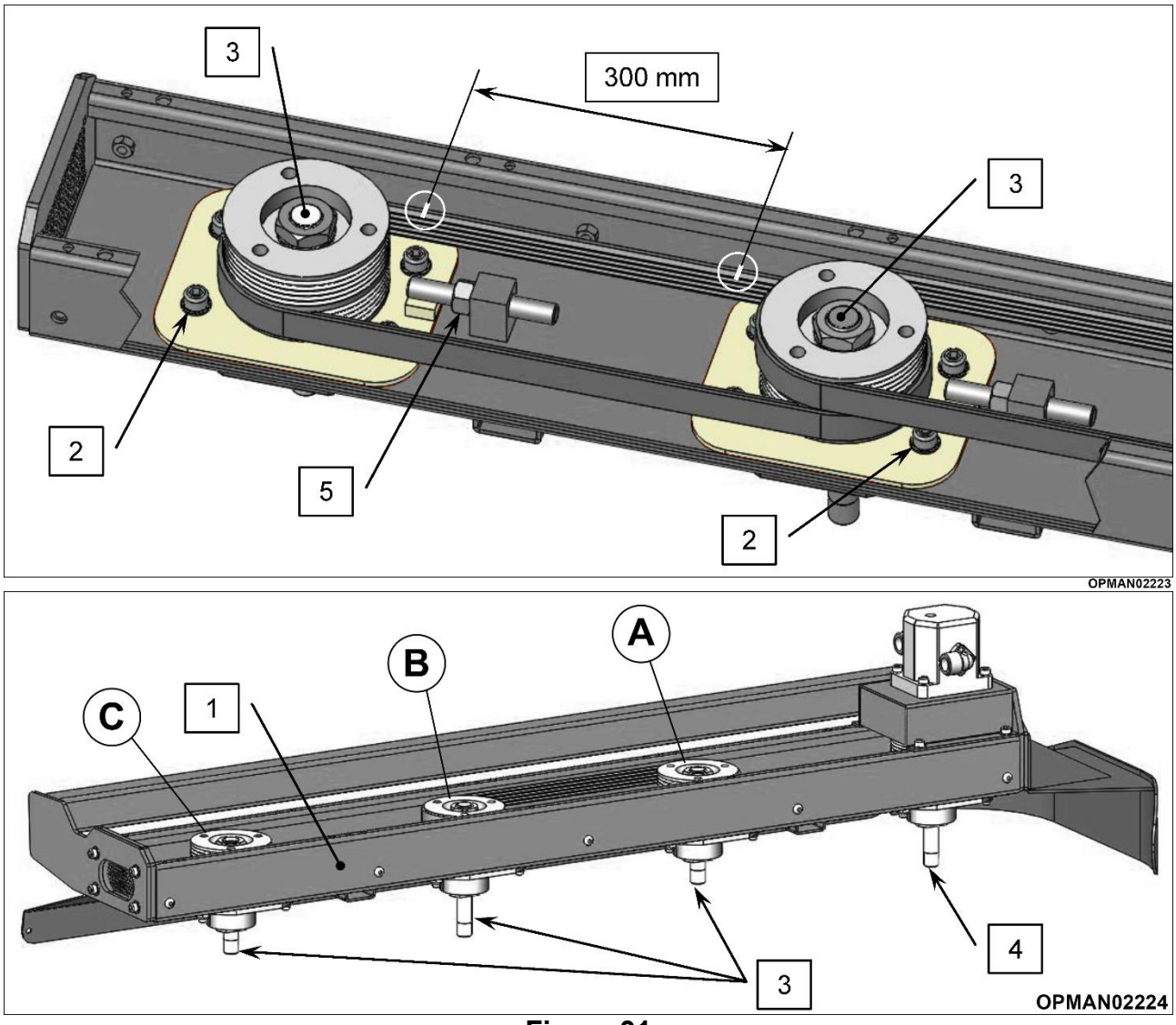


Figure 31

12.5.1.6 Slack the nut (5) on every blade bearing (except the motor bearing). The blade bearings must be able to slide. The belts are now slack.
12.5.1.7 Starting with the first blade bearing assembly (A) that is closest to the motor bearing (4), retighten the nut (5) to slightly tension the belt. It must no longer be slack.
12.5.1.8 Draw two marks on one side of the belt, 300 mm from each other.
12.5.1.9 Screw on the nut (5) to tension the belt until a distance of 302.5 mm is achieved.
12.5.1.10 Turn the blade bearing (3) by hand, three or four turns.
12.5.1.11 Check the distance measurement once again. If the measurement is not 302.5 mm, repeat the operation until it is achieved.
12.5.1.12 Tighten the screws (2) on the blade bearing (3).
12.5.1.13 Repeat the operation on the second bearing assembly (B) and then the third bearing assembly (C).
12.5.1.14 Screw down the covers and refit the blades.

12.5.2 Replacing The Belts

12.5.2.1 Slacken the belts following the procedure shown “Tensioning The Belts”, Section 12.5.1.

With reference to Figures 32 and 33:
12.5.2.2 Remove the cover (6) located on the motor mount (7).
12.5.2.3 Turn the motor bearing until the screw (8) is aligned with the hole (A).
12.5.2.4 Slacken the screw (8) that holds the key into the motor shaft.
12.5.2.5 Loosen and remove the motor (10) and its mount (7).
12.5.2.6 Remove the worn belts and completely clean the inner saw head body.
12.5.2.7 Check the condition of the bearings, the bearing seals and visually inspect the condition of the pulley notches. Make sure there are no foreign objects.
12.5.2.8 Install the first new belt (11) between the second and third third. Located on the furthest end away from the skid (B) onto lower pulley notches.
12.5.2.9 Install the second belt (12) between the motor pulley and first pulley assembly.
12.5.2.10 Install the third belt (13) between the first pulley and second pulley assembly.
12.5.2.11 Tension the belts as stated in the Section 12.5.1, beginning with the bearings closest to the motor and then moving outwards.
12.5.2.12 Refit and tighten the motor mount (7) and the motor (10).
12.5.2.13 Tighten screw (8) and refit the cover (6).
12.5.2.14 Tighten down the covers and refit the blades.

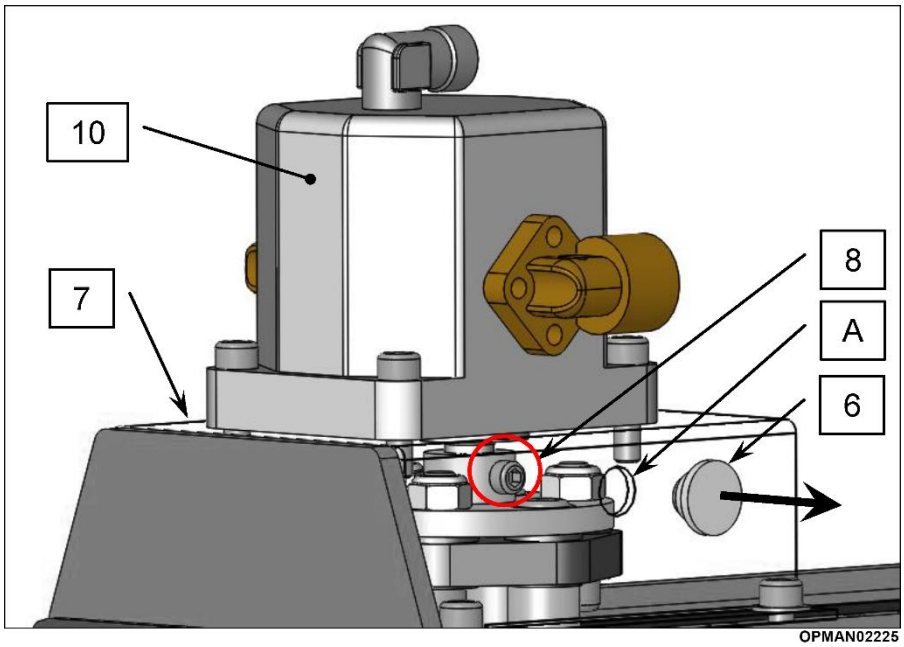


Figure 32

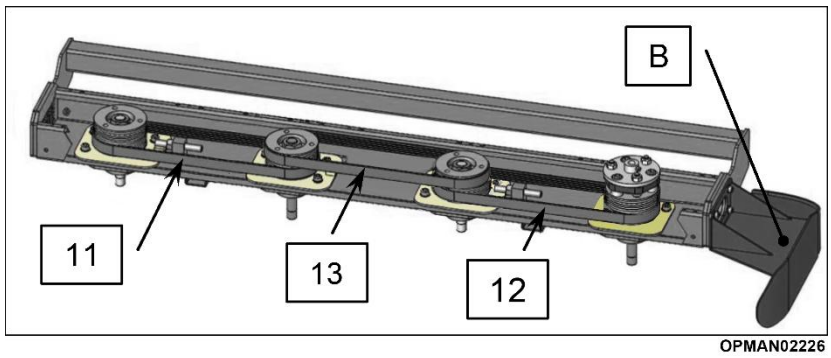


Figure 33

12.6 Adjusting The Pressure Limiter (Optional)

The Saw Head may not be adjusted prior to setting into service to make it suitable with working with the desired carrier arm.

Figure 34

This action is hazardous and must be performed by staff trained to perform hydraulic system maintenance work.

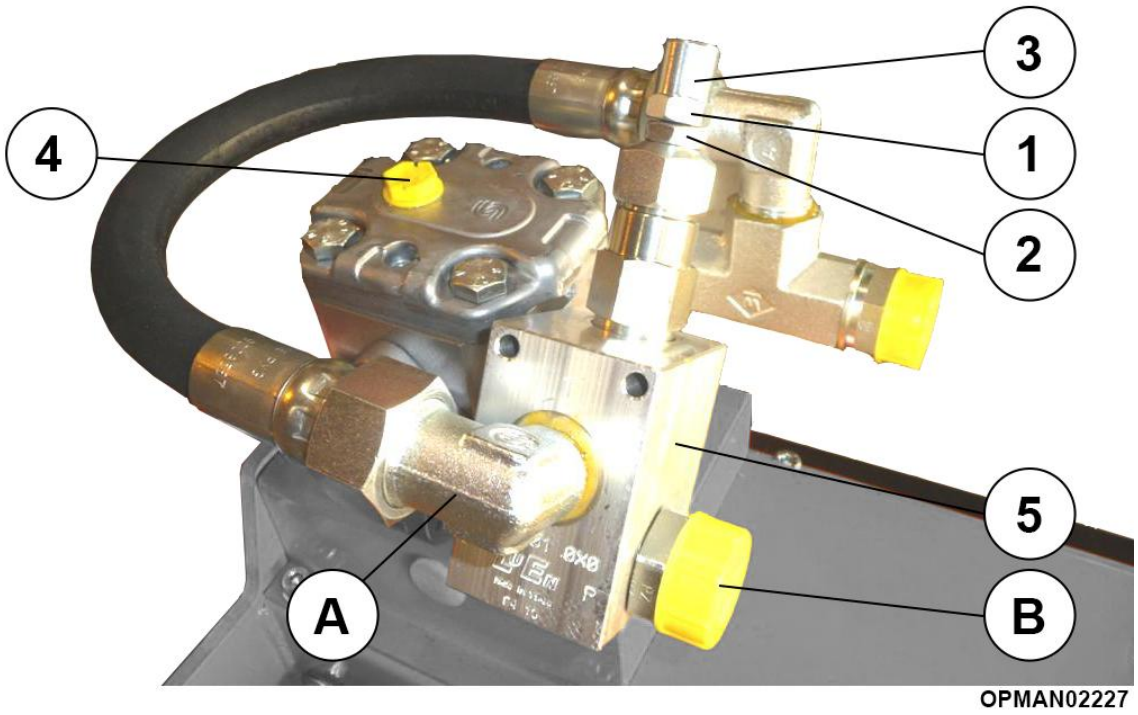


Figure 35

With reference to Figure 35:

12.6.1.1 Check that nobody is present nearby
12.6.1.2 Position the Saw Head at a suitable height to be able to easily reach the pressure limiter
12.6.1.3 Check that there is no pressure in the hydraulic system
12.6.1.4 Completely unscrew in (A) the adapter between the motor (4) and the pressure limiter (5)
12.6.1.5 Screw 1/2” BSP blanking plugs on the open holes in the pressure limiter and the motor
12.6.1.6 On the port (B) connect in series a pressure gauge on the supply hose

Check that no openings are open to the outside air and that the pressure gauge is correctly screwed down.

12.6.1.7 Unscrew the protective cover (1) from the pressure limiter
12.6.1.8 Unscrew the lock nut (2) from the pressure limiter
12.6.1.9 Switch on the supply circuit of the Saw Head. The circuit pressure rises
12.6.1.10 Tighten the adjustment screw (3) on the corresponding pressure limiter until the pressure reached is; as shown in the table of “Technical Characteristics”, see Section 6.2/Table 3.
12.6.1.11 Tighten the locking nut (2) back down and stop the Saw Head motor.
12.6.1.12 Screw the protective cover (1) back on.
12.6.1.13 Once the pressure limiter is set to the correct value, remove the pressure gauge and reconnect the pressure limiter on the adapter (A) as it was before the calibration.

12.7 Adjusting The Rotation Speed Of The Blades

To achieve quality cutting, it is essential to always set the carrier engine to the same speed to achieve the right rotation speed for the blades.

12.7.1.1 Place the saw head in the vertical position.
12.7.1.2 Start the saw head motor.
12.7.1.3 Use a tachometer to measure the rotation speed of the blades and set it to 2,000 rpm by varying the speed of the carrier engine.
12.7.1.4 Raise this speed value.
12.7.1.5 Every time the Saw Head is used, run the carrier engine at the same speed.

12.8 Adjusting The Carrier Arm Fixing Position

In some special cases, it is an advantage to be able to adjust the saw head span on the support tube.

With reference to Figure 36, to adjust the span:

12.8.1.1 Slacken both of the U bolts connecting the saw head to the carrier clamp bracket and slide, to the desired location, the carrier clamp bracket (1) on the Saw Head support tube (2).

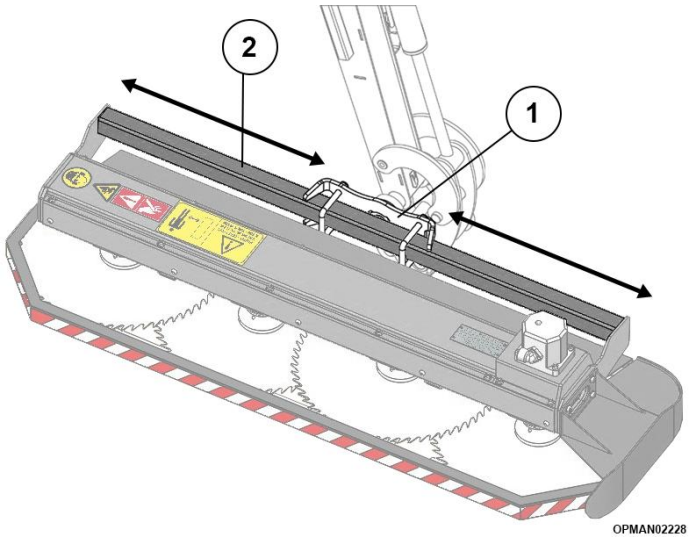


Figure 36

Check that the hoses are not trapped and that their length and curves are sufficient.

12.9 Faults And Troubleshooting

Faults	Causes	Corrections
Damaged belts	Blade jamming caused by: • Impact by a blade against an obstacle (rock, post, etc.). • Incorrect action while cutting a large branch. • Incorrect blade sharpening and setting. Failure to set the necessary rotation speed (2,000 rpm), blades spinning too fast or too slow.	Determine the precise cause Replace the one or more damaged belts; see "Replacing The Belts", Section 12.5.2.
Damaged bearing shaft: Shaft breakage.	Violent impact with an obstacle. The saw head was moved while the blade was engaged in a large branch. Bearing seizure (poor greasing).	Remove the blade bearing and replace all damaged parts; see "Spare Parts", Section 14.
None of the bearing shafts turn	Poor hydraulic connection to the motor. Motor key broken. Drive bushing (damper) destroyed.	Check the connection; see "Hydraulic Connection", Section 8.2.3 and the machine circuit. Replace the key and check the condition of the shaft and the half coupling; see "Spare Parts", Section 14. Replace the half-coupling (damper) and check the condition of the other parts; see "Spare Parts", Section 14.
Unusual noise in the saw head	Damaged coupling. Slack pulley.	Replace the coupling and check the condition of the other parts; see "Spare Parts", Section 14. Check the condition of the pulley, the keys, the shaft and the pulley spacer and retighten correctly; see "Fasteners", Section 12.2.
Leak on the motor shaft	Too much pressure on the motor Drain; see "Technical Specifications", Section 6.2.	If connected using couplers, check that the insertion is correct. Check that this drainage is a direct one to the tank without passing through the filter. Check that the drainage piping is not damaged, crimped, etc.

Table 7

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13 Disposal

The Saw Head contains components that are hazardous to the environment.

You are responsible for disposing of this waste. Comply with local regulations for disposing of metals, plastic parts (belts, coupling damper), hydraulic fluid, grease and other products.

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14 Spare Parts

14.1 How To Obtain The Correct Spare Part Numbers

For correct part numbers; use the Spearhead interactive online parts books. These are available at https://my.spearheadmachinery.com/parts/public-interactive-parts-database/
You will need to enter the machine serial number; see Figure 37.

14.1.1.1 Enter the serial number.

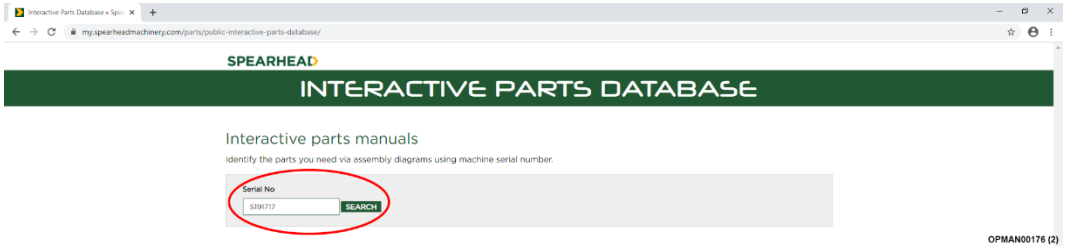

Figure 37 – Type In Serial Number

14.1.1.2 After entering the serial number a specification for the machine will appear. Click on the serial number; see Figure 38.

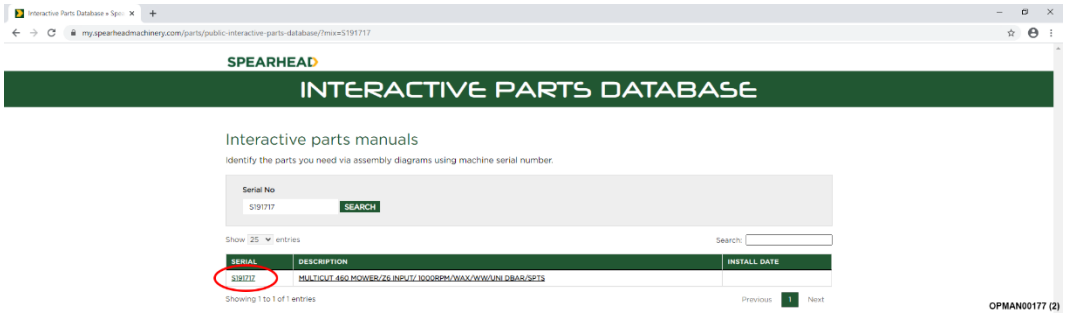

Figure 38 – Click On Serial Number

14.1.1.3 After clicking on the serial number a full parts breakdown, specific to the machine serial number will appear showing the various parts and assemblies of the machine. Click on the specific assembly picture required; see Figure 39.

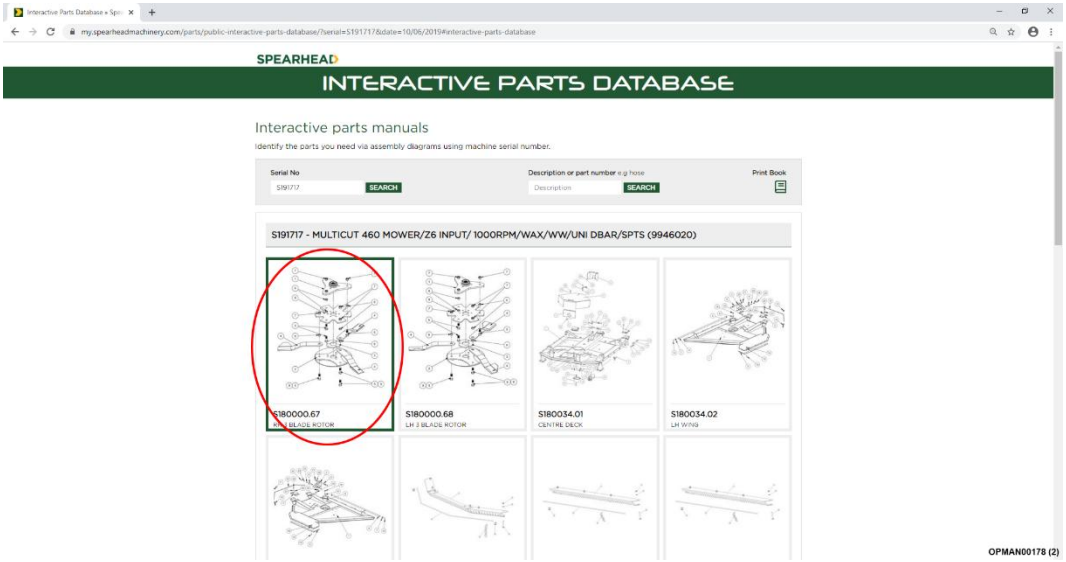

Figure 39 – Click On Assembly

14.1.1.4 You will finally be presented with a full exploded parts breakdown for that particular assembly, giving part numbers and the quantities required; see Figure 40.

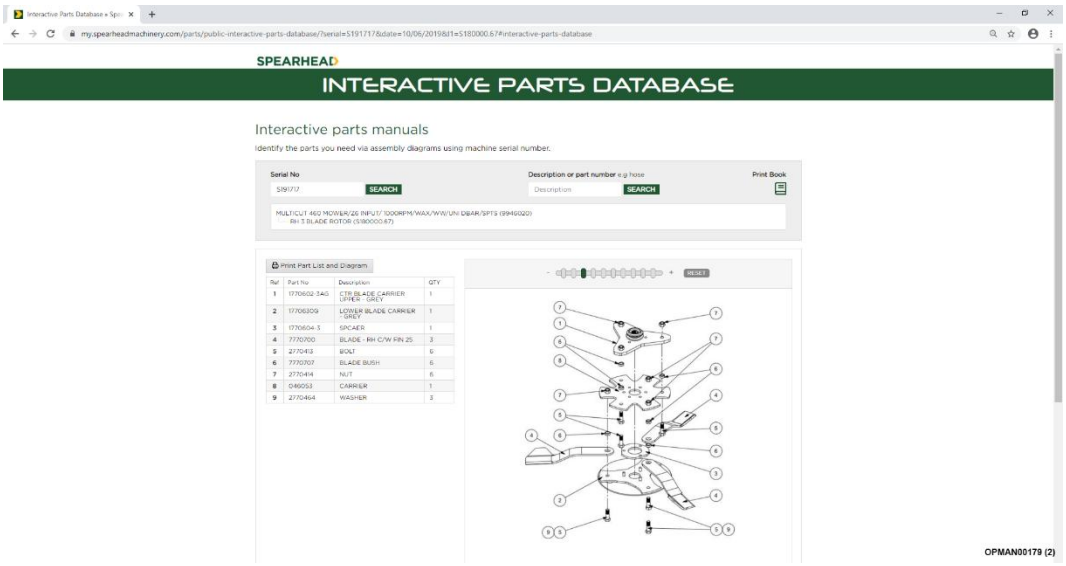

Figure 40 – Exploded Parts Breakdown With Bill Of Materials

14.2 Spare Parts Ordering

It is important to note that when it comes to ordering replacement parts, that this can **only** be carried out through a Spearhead dealer. **Spearhead does not accept direct customer parts orders over email, fax or telephone**.

For guidance on finding your local Spearhead dealer; see Section 14.3.

14.3 Dealer Network

Spearhead has an extensive dealer network which can offer genuine replacement parts.

In order to make it easier to find your local Spearhead dealer, the Spearhead website has a Dealer Locator facility.

http://www.spearheadmachinery.com/dealer-locator/

To find your local Spearhead dealer enter your location or postcode into the “Your location” box and then press “Search”; see Figure 41.

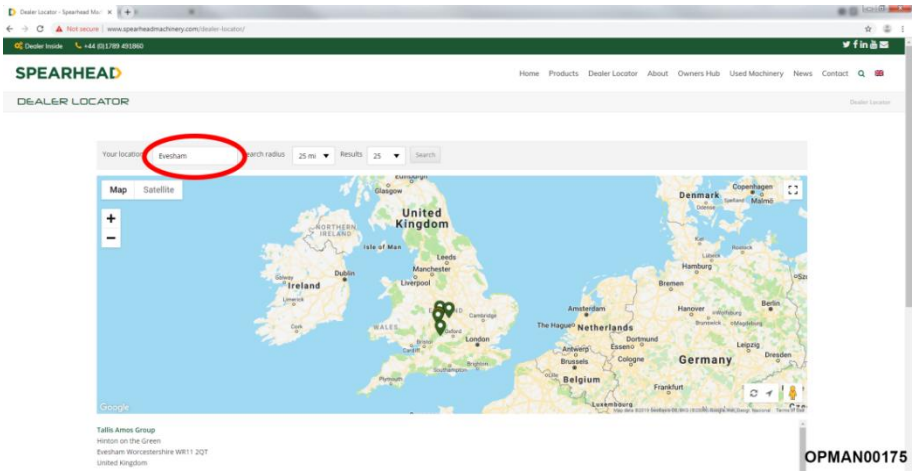

Figure 41 – Dealer Locator

Notes

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