

Spearhead

RHD Series Flail Mowers RHD 230/250/280



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Part No. 8999048

HANDBOOK & PARTS MANUAL

Spearhead

RHD Series Flail Mowers RHD 230/250/280

Handbook & Parts Manual

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.

(If the machine is resold the Manual must be given to the new owner.)

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.

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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			PORT ADAPTORS WITH BONDED SEALS		
BSP	Setting	Metric	BSP	Setting	Metric
1/4"	18 Nm	19 mm	1/4"	34 Nm	19 mm
3/8"	31 Nm	22 mm	3/8"	47 Nm	22 mm
1/2"	49 Nm	27 mm	1/2"	102 Nm	27 mm
5/8"	60 Nm	30 mm	5/8"	122 Nm	30 mm
3/4"	80 Nm	32 mm	3/4"	149 Nm	32 mm
1"	125 Nm	41 mm	1"	203 Nm	41 mm
1.1/4"	190 Nm	50 mm	1.1/4"	305 Nm	50 mm
1.1/2"	250 Nm	55 mm	1.1/2"	305 Nm	55 mm
2"	420 Nm	70 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.

CE Declaration of Conformity, Conforming to EU Machinery Directive 2006/42/EC

We, Spearhead Machinery Ltd, Green View, Salford Priors,
Evesham, Worcestershire, WR11 8SW hereby declare that:

Product

Product Code.....

Serial No.....

Type.....

Manufactured by: Alamo Manufacturing Services (UK) Limited, Station
Road, Salford Priors, Evesham, Worcestershire, WR11 8SW

Complies with the required provisions of the Machinery Directive
2006/42/EC. The Machinery Directive is supported by the following
harmonized standards:

- BS EN ISO 14121-1 (2007) Safety of Machinery – Risk Assessment,
Part 1: Principles Part 2: Practical Guide and Examples of Methods.
- BS EN ISO 12100-1 (2010) Safety of Machinery – Part 1: Basic
Terminology and Methodology Part 2: Technical Principles.
- BS EN 349 (1993) + A1 (2008) Safety of Machinery – Minimum
Distances to avoid the Entrapment of Human Body Parts.
- BS EN 953 (1998) Safety of Machinery – Guards General
Requirements for the Design and Construction of Fixed and Movable
Guards.
- BS EN 982 (1996) + A1 (2008) Safety Requirements for Fluid Power
Systems and their Components. Hydraulics.

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

Signed



(On behalf of Spearhead Machinery Ltd)

Status

General Manager

Date

.....

RHD Series RHD 230/250/280

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RHD Series RHD 230/250/280

General Information

Always read this manual before fitting or operating the machine – whenever any doubt exists contact your dealer or the Spearhead Service Department for advice and assistance.

Use only Spearhead Genuine Parts on Spearhead Equipment and Machines

DEFINITIONS – The following definitions apply throughout this manual:

WARNING

An operating procedure, technique etc., which –
can result in personal injury or loss of life if not observed carefully.

CAUTION

An operating procedure, technique etc., which –
can result in damage to either machine or equipment if not observed carefully.

NOTE

An operating procedure, technique etc., which –
is considered essential to emphasis.

LEFT AND RIGHT HAND

This term is applicable to the machine when attached to the tractor and is
viewed
from the rear – this also applies to tractor references.

MACHINE DESCRIPTION & PURPOSE OF USE

The RHD series of machines are '3-point linkage' tractor mounted universal flail mower/shredders designed primarily for the mulching of grasses, brambles, small bushes, branches, vines, and general crop residues. Their tough construction, working widths of 2.3, 2.5 or 2.8m and offset capability of up to 0.5m makes them ideal for maintenance use in all green areas, vineyards, orchards, on verges and in scrubland by farmers and contractors alike.

These machines should only be used to perform tasks for which they were designed – use of the machine for any other function may be both dangerous to persons and damaging to components and is therefore not advisable.

RHD Series RHD 230/250/280

Machine Identification

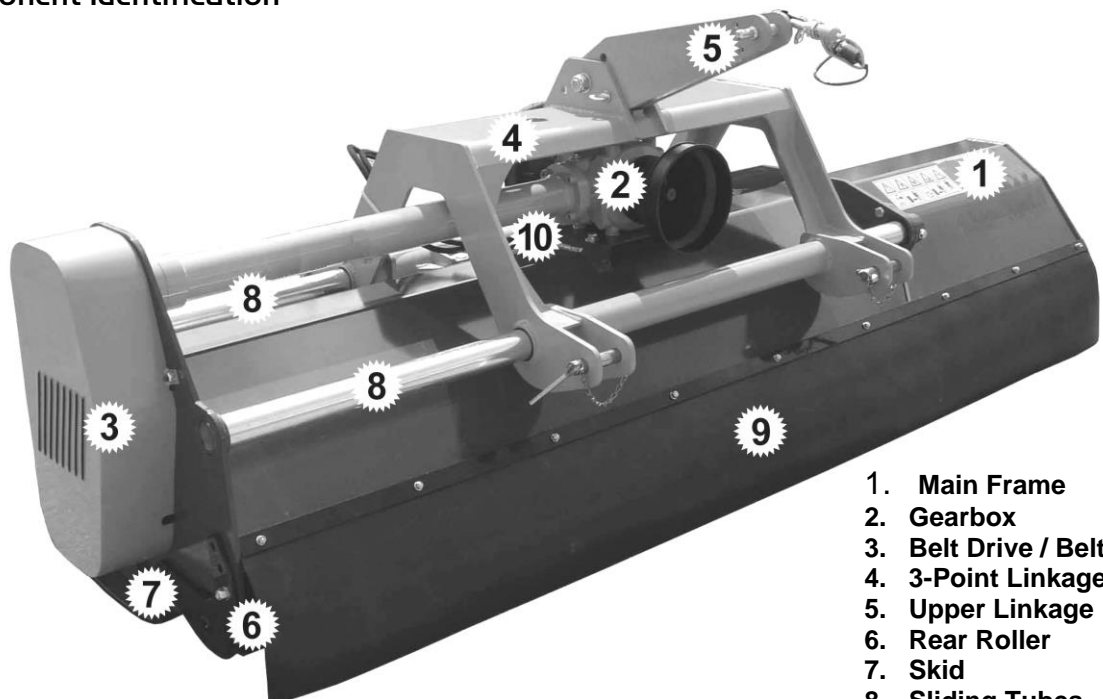
Each machine is fitted with an identification plate with the following information:

1. Machine (Part Number)
2. Machine Serial No.
3. Machine Weight

When ordering spares or replacement parts from your local dealer it is important to quote both Part Number and Serial Number as stated on the identification plate so the machine and model can be quickly and correctly identified.

Technical Data

Component Identification



1. Main Frame
2. Gearbox
3. Belt Drive / Belt Guard
4. 3-Point Linkage
5. Upper Linkage
6. Rear Roller
7. Skid
8. Sliding Tubes
9. Rubber Guard
10. Hydraulic Ram

RHD Series RHD 230/250/280

Technical Specifications

SPECIFICATION	RHD230	RHD250	RHD280
Working Width	2280mm	2440mm	2770mm
Tractor Power Requirement	55-60 HP	65-75 HP	75-85 HP
PTO RPM	1000 RPM	1000 RPM	1000 RPM
Rotor Shaft RPM	2243 RPM	2243 RPM	2243 RPM
Hammer Blades	26	28	32
Y-Blades	78	84	96
Machine Weight	750kg	785kg	850kg
Offset Capability	500mm	500mm	500mm
Linkage Type	3-Point (Cat. II)	3-Point (Cat. II)	3-Point (Cat. II)
Machine Width	2510mm	2670mm	3000mm
Machine Length	1010mm	1010mm	1010mm
Machine Height	1050mm	1050mm	1050mm

Optional Equipment

The standard flails fitted to the machine are the hammer blade type, Y-blade flails are optional. The cutting capability of the each particular type of flail will be dependant on the sort and hardness of the material being cut, but in general the following cutting thicknesses apply:

Y-blade flails – for materials up to a maximum of 30mm diameter.

Hammer flails – for materials up to a maximum of 50mm diameter.

Noise Level

The sound level of this machine, as measured at the operator's ear, is within the range of 70 to 90 dB when the rear window of the tractor is open. We recommend that ear protectors are worn and the tractor windows kept closed at all time when operating this machine.

Safety Information

General Safety Rules:

- ▲ Always read and follow the instructions for the use and maintenance of the machine before carrying out any work operations or servicing tasks.
- ▲ Improper use of the machine is both highly dangerous to persons and damaging to the machine components – only use the machine for its designated task.
- ▲ Both operators and the maintenance fitters should be familiar with the machine and fully aware of dangers surrounding improper use or incorrect repairs.
- ▲ Before starting, checks to both tractor and machine must be carried out as regards: functionality, road safety, accident prevention rules.
- ▲ Even when using the machine correctly, stones or other objects may be thrown a long distance. Therefore nobody must stand within the danger area. Special attention must be paid when working near roads or buildings.
- ▲ Use tractor's fitted with safety cabs.
- ▲ The condition of flails and of machine guards must be checked before beginning the daily work - they must be replaced if damaged or missing before you use the machine.
- ▲ During checks or repairs, make sure nobody could start the machine by mistake.
- ▲ Never wear loose or fluttering clothes.
- ▲ Never carry passengers on the tractor.
- ▲ Never carry passengers on the machine.
- ▲ Never connect the power takeoff with the engine running.
- ▲ Never approach the machine until the rotor has completely stopped.
- ▲ Do not enter the working zone of the PTO shaft. It is dangerous to approach the rotating parts of a machine.
- ▲ Keep the PTO shaft guard in good condition.
- ▲ Before starting, check the surrounding area for the likely presence of children and/or animals.
- ▲ Do not stand near the machine when it is operating.
- ▲ The PTO shaft must be assembled and disassembled only with the engine stopped and the starting key removed.
- ▲ Before connecting the power takeoff, check that the speed and the rotational direction correspond to those of the machine.
- ▲ Immediately replace missing or damaged safety decals.
- ▲ Before leaving the tractor with the machine attached, proceed as follows:
 1. Disconnect the power takeoff,
 2. Put the machine steadily on the ground using the tractor's hydraulic lift.
 3. Apply the hand brake and, if the ground is steeply sloping, wedge the tractor.
 4. Remove the starting key.

Transportation Safety

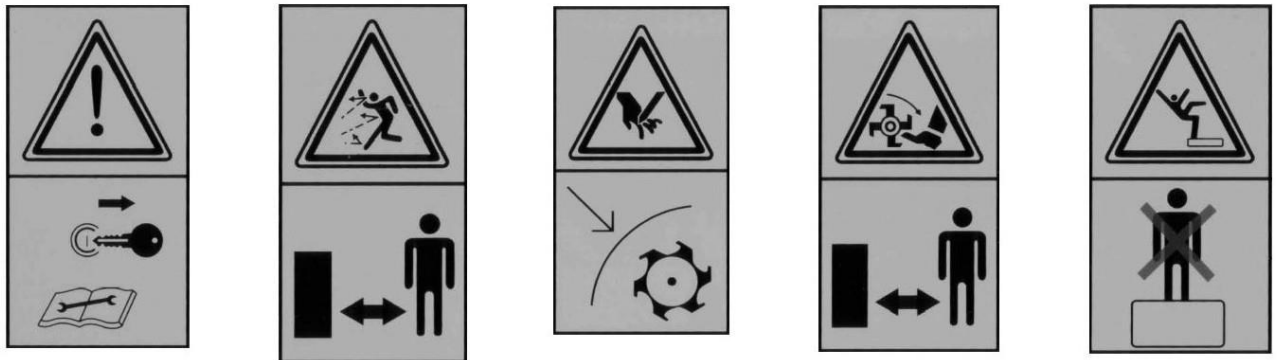
- ▲ In transport, reduce speed, especially on bumpy roads, the weight of the machine may render driving difficult and damage the machine itself.
- ▲ Ensure the levers that operate the hydraulic lift are locked, to avoid the lowering of the machine during transport.
- ▲ When driving on public roads, respect all road rules in force.
- ▲ Never transport the machine with the rotor running, even for short distances.

Operating Safety

- ▲ Pay special attention when working with the machine not to touch fixed objects such as road drain, walls, shafts, kerbs, guard rails, tracks etc. This could cause the breakage of the flails, which would be thrown out of the machine at very high speed.
- ▲ If wires, ropes or chains should become entangled in the rotor stop immediately to prevent damage or dangerous situations; stop the rotor and the tractor, take out the starting key. Put working gloves on; clear the rotor with the aid of pliers or shears. Do not try to disentangle by inverting the rotational direction of the rotor.
- ▲ Do not use the machine when excessive vibration is experienced, as this may cause breakage and serious damage - find the cause of the vibration and eliminate it before using the machine again.

Although the information given here covers a wide range of safety subjects, it is impossible to predict every eventuality that can occur under differing 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.

SAFETY DECALS



1.

2.

3.

4.

5.

1. Always switch machine off, remove starting key and read instruction manual before performing service or maintenance work on the machine.
2. Keep a safe distance from the machine at all times - risk from projection of objects.
3. Risk of hand injury – always ensure all guard are fitted and in place when machine is operating.
4. Risk of feet injury – keep at a safe distance from the machine when it is operating.
5. Never stand or ride on the machine.

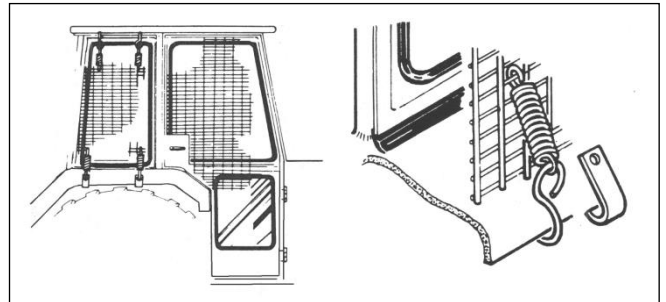
Vehicle /Tractor Preparation

We recommend vehicles are fitted with cabs using 'safety glass' windows and protective guarding when used with our machines.

Fit Operator Guard (part no. 73 13 324) using the hooks provided. Shape the mesh to cover all vulnerable areas.

Remember the driver must be looking through mesh and/or polycarbonate glazing

when viewing the machine in all positions - 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 protective equipment 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 to EN297, gloves, filter mask and high visibility clothing.



Vehicle Ballast

It is imperative when attaching 'third-party' equipment to a vehicle that the maximum possible stability of the machine and vehicle combination is

achieved – this can be accomplished by the utilisation of ‘ballast’ in order to counter-balance the additional equipment added.

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.

Where a machine works to the side of the tractor rear weights may be required to maintain a reasonable amount of rear axle load on the opposing wheel.

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 - factors that effect stability are:

- Centre of gravity of the tractor/machine combination.
- Geometric conditions, 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 unit during these operations.
- Ground conditions, e.g. slope, grip, load capability of the soil/surface.
- Rigidity of implement mounting.

Suggestions to increase stability:

- Increasing rear 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.

The advice above is offered as a guide for stability only and is not a guide to vehicle strength. It is therefore 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.

RHD Series RHD 230/250/280

Attaching The Machine To The Tractor

Attachment of the machine to the tractor should always be performed on a firm level site.

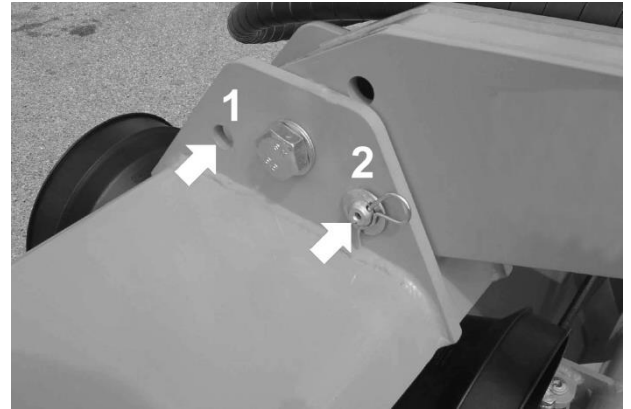
Upper Linkage Position

The upper linkage of the machine has two working modes to allow the machine to be mounted and operated either on the front of the tractor or on the rear:

1. Front Mounted Linkage Position

2. Rear Mounted Linkage Position

To swap the linkage position, remove the position locking pin and swing the linkage over to the opposing side of the machine, replace the position locking pin and secure in place with a locking clip



NOTE: The position locking pin must always be in position during attachment and transportation of the machine but can be removed during work for a floating position. Always remember to replace the pin before re-transporting the machine.

Linkage Points

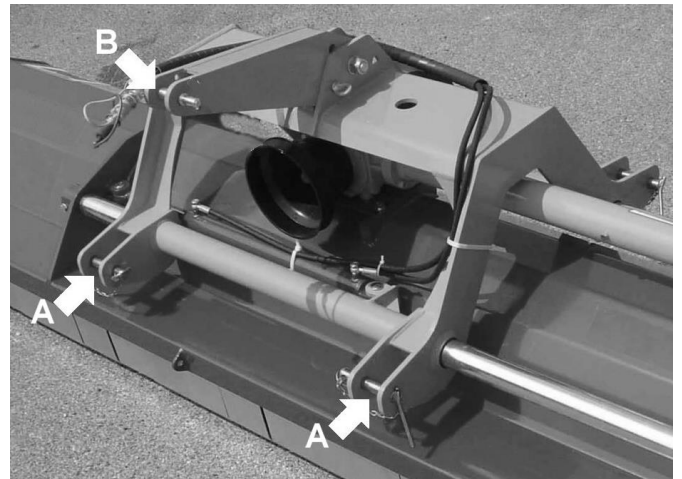
A – Lower Attachment Points (Linkage Arms)

B – Upper Attachment Point (Top Link)

Attachment to Tractor

Determine if the machine is to be front mounted or rear mounted and set the upper linkage into the required position as described above.

Position the tractor's lower linkage at the same height as the machines lower attachment points – indicated 'A' in the diagram above.



Remove the machine lower linkage pins from location 'A'.

Carefully manoeuvre the tractor squarely to the machine and into its position within the attachment points – fine adjustment of the tractor lower linkage height may be necessary to correctly position the linkage and permit refitting of the linkage pins.

Insert linkage pins at location 'A' and secure in position with locking clips.

Fit top link to upper attachment point 'B'.

Raise the machine on the tractors hydraulics and adjust top link so that the machine is parallel to the ground.

Fit and adjust check chains and/or stabiliser bars to lock the machine into a central position on the tractor.

Connect hydraulics.

Fit PTO Shaft and attach torque chains to a suitable location – refer to following page for details of PTO measurement and shaft length adjustment.

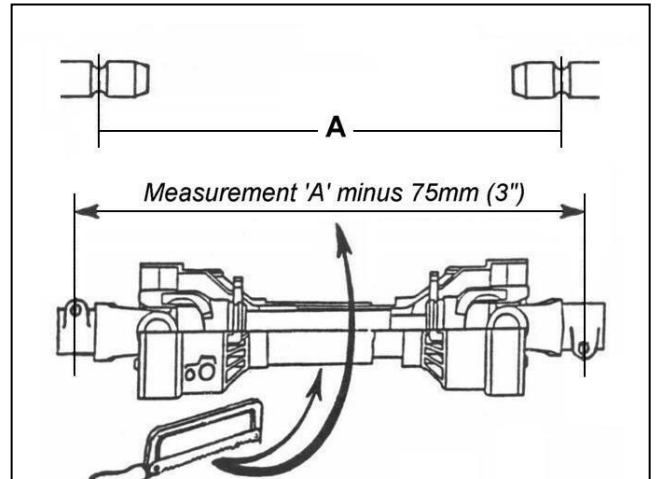
PTO Shaft Measurement

Measure the PTO shaft and cut to the dimension shown – the finished length of the PTO shaft should be 75mm (3") less than the measured distance 'A' - between tractor shaft and gearbox stub shaft - to enable fitting.

NOTE:

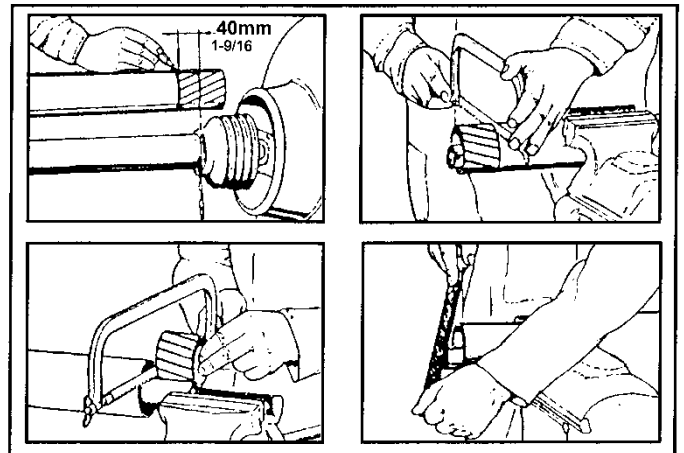
For subsequent use with different tractors measure again, there must be a minimum shaft overlap of 150mm (6").

Fit PTO in position and attach the torque chains to a convenient location to prevent the shaft guards from rotating.



PTO Shaft Length Adjustment

1. Shorten outer plastic tube to 40mm less than the shortest envisaged shaft length.
2. Remove the marked tube.
3. Remove same length from inner plastic tube and metal shaft profiles (inner and outer).
4. De-burr all edges and remove 'swarf' to ensure smooth operation.



Pre-Operational Checks

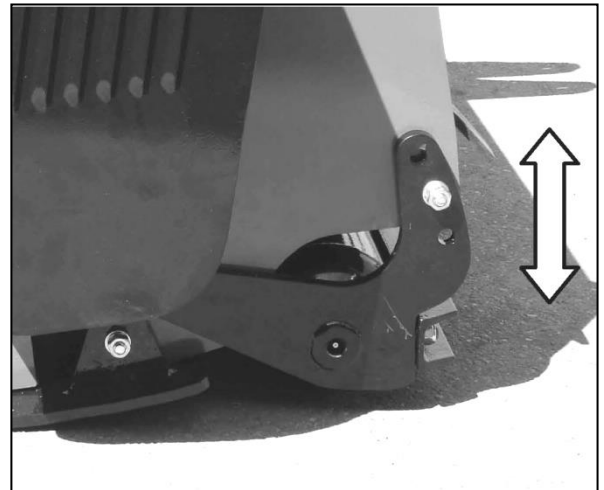
Before commencing work with the machine the following checks should be performed:

- Make a visual inspection of the machine to ensure it is in good operational condition.
- Check all safety guarding is in position and in full working order.
- Check rotor for missing or damaged flails and replace if required.
- Check all greasing points are well lubricated.
- Check gearbox oil level.
- Check belt tension and adjust if required.
- Check PTO speed and direction match that of the machine.

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Setting Up & Adjustment

The height of cut is dependent on working conditions and volume of material. The cutting height can be regulated with the hydraulic system on the tractor and/or rear roller adjustment. The minimum height of cut should be between 1 – 3cm.



NOTE: The machine must always run on the rear roller not the side skids – side skids are a protection feature and in normal working conditions remain clear of the ground.

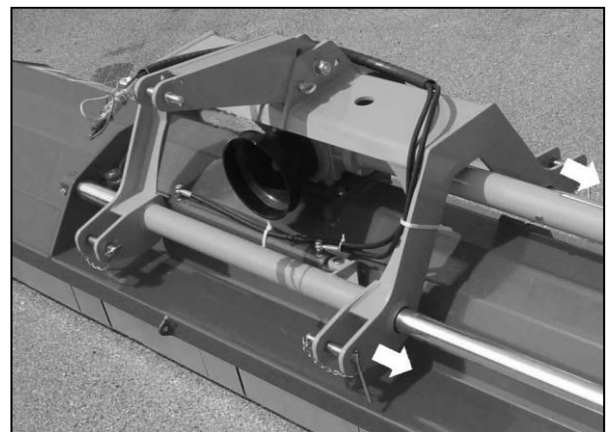
Do not allow the rotor flails to contact the ground - set roller

height to allow a minimum flail to ground clearance of 1 to 3cm.

Offsetting

The machine features a hydraulically operated offsetting capability of up to 500mm allowing the machine to cut larger areas of material beyond the wheel tracks of the tractor – this is particularly useful for verge mowing duties and work in areas of limited or restricted accessibility.

The machine offsets to the right hand side of the tractor.



Hydraulically operated offset of up to 500mm

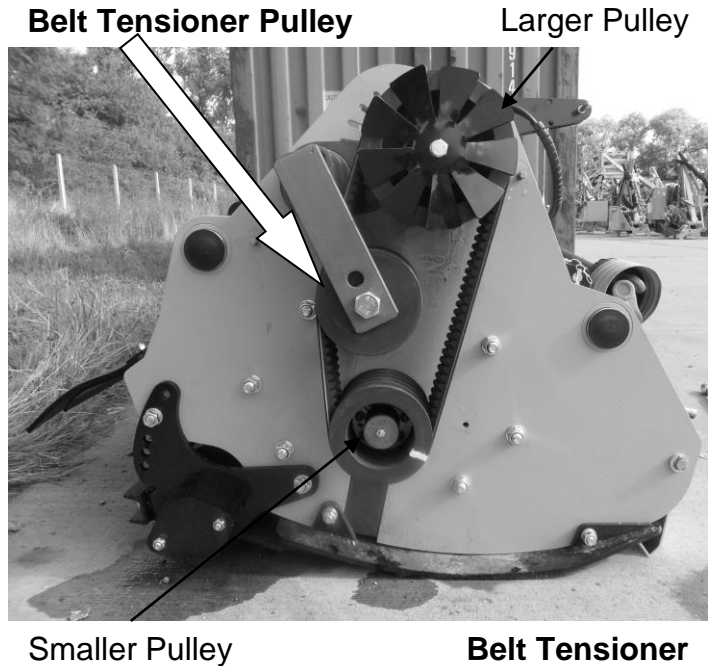
RHD Series RHD 230/250/280

Drive Belts

Power from the tractor via the machines gearbox and half-shaft is transferred to the rotor through sets of belts - *the RHD 230 models employ a 4 belt system and RHD 250 & 280 models employ a 5 belt system.* Correct tensioning of the belts is required for both optimal operation of the machine and long lasting belt life – in order to ensure correct belt tension the machines are fitted with automatic belt tensioning.

Belt Tensioner

Machines are fitted as standard with an automatic belt tensioning system. The system consists of a pre-tensioned arm and strain pulley set at 22° that permanently runs on the belts exerting sufficient pressure to keep the belts correctly tensioned. For correct tension the system must be set at an angle of 22° – an arrow is marked on the tension device to aid its setting, which should always be performed when the belts are cold. No other adjustment or maintenance will be required on the belt tensioning system other than routine inspection and general cleaning of components when inspecting belt wear.



WARNING: Checking of belts and drive components should only be carried out with tractors engine switched off, starting key removed and the PTO shaft disconnected. Never attempt to run the machine with the belt guard removed.

Machine RPM

These machines are all 1000 RPM - before operating the machine always ensure the RPM is compatible with the tractor PTO speed – this is particularly important on tractors that have different PTO speeds front and rear.

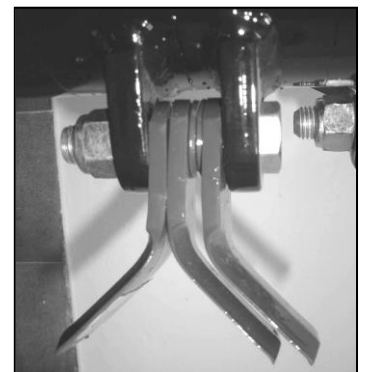
WARNING: Always check machine and tractor PTO speeds are compatible before using the machine.

Flail Types

Two types of flails are available for use with these machines, these are shown below;



Hammer Flails



Y-Flails

RHD Series RHD 230/250/280

Operation

Ensure that the operator is suitably qualified to use a machine of this nature and that they have fully read and understood this manual - they should be aware of all safety aspects relating to the safe use of the machine. It is advisable that all 'first time' operators practice using the machine in a clear safe area prior to work in order to familiarise themselves with its operation.

After the initial first 1 hour of work with a new machine, nuts and bolts should be checked for tightness and the drive belts inspected and re-tensioned if required – refer to belt section for details.

Prior to starting work the area should be checked for dangerous objects such as large stones, wood, wire, glass etc. – hazardous objects should be removed from the area prior to operation with the machine. The location of unmovable or natural hazards should be noted, or if necessary 'marked', to indicate to the operator that the area should either be avoided or additional caution adopted whilst working around the hazard.

Starting Work

With the machine switched off, lower it into a position approximately 10cm above the ground, start the machine and allow it to build up to the correct working speed before gently lowering the it onto the ground - the machine is now in its work position and forward travel can begin.

Forward Speed

The forward working speed will depend on the working conditions and nature of the material being cut. Optimal speed will be in the region of 3-8 km/h (2-5 mph).



Optimal forward working speed 3-8 km/h



Raise the machine before turning or reversing

Reversing & Turning

When reversing or turning the unit the machine must always be lifted clear of the ground to avoid damage.

Transport

The following must be observed at all times when transporting the machine:

- Machine must always be switched off.
- Machine must be raised and placed into its central position.
- Speed must be kept to a minimum especially on bumpy roads or terrain.
- Always abide with local laws and road regulations.
- Be aware of the machines width.

Detachment & Storage

Detaching the machine from the tractor

- Removal of the machine should be performed on a firm level site. The procedure for detachment is as follows:
- Place the machine in its central position.
- Gently lower the machine fully to the ground.
- Switch off the tractor and remove its starting key.
- Detach hydraulic hoses from the tractor service and stow them neatly on the machine.
- Remove the PTO driveshaft.
- 'Chock' the rear roller to prevent movement of the machine during the detachment procedure and whilst in storage.
- Remove the top link and both pins from the lower attachment points.
- Carefully and slowly drive the tractor clear of the machine.
- Clean and lubricate the machine in preparation for next use.

Storage

For extended periods of storage it is advisable that the machine be kept in a clean dry environment protected from the elements to avoid risk of corrosion. The machine should be thoroughly cleaned and lubricated prior to storage. At this point it is good practice to check the machine for worn or damaged components - any parts that require replacing should be ordered and fitted at the earliest opportunity so the machine is fully prepared for the next seasons work.

Maintenance

All maintenance, cleaning and repair operations must be performed with the machine firmly lowered to the ground and detached from the tractor or with the PTO disconnected, engine switched off and starting key removed. For any repairs or maintenance that requires access from underneath, the machine should be firmly and safely raised and propped using suitable purpose designed supports capable of bearing the machines full weight. Care should be adopted at all times when working with or under a raised machine.

Maintenance Tasks

The following preventative maintenance tasks should be performed at the timescales stated to both maximise efficiency and prolong the working life of the machine.

After first 1 hour of work - new machine or machine fitted with new belts.

- ✓ Check all nuts and bolt for tightness – *retighten if required.*
- ✓ Check belt tension and adjust if required – *refer to belt section for details of adjustment.*

After every 8 hours of work

- ✓ Check all nuts and bolt for tightness – *retighten if required.*
- ✓ Check belt tension and adjust if required – *refer to belt section for details of adjustment.*
- ✓ Check wear and condition of flails – *replacing missing, or damaged flails immediately.*
- ✓ Check condition of safety guards – *repair or replace if not performing their function.*
- ✓ Lubricate grease points – *see below for locations of the machines grease points.*
- ✓ Check gearbox oil level – *top up if required.*
- ✓ Check rotor – *remove foreign objects that may be fouling or lodged in the rotor.*
- ✓ Check frame and 3-point hitch – *ensure all components are in a safe working condition.*

After every 100 hours

- ✓ Grease PTO driveshaft – *separate telescopic drive and apply grease to internal shaft.*

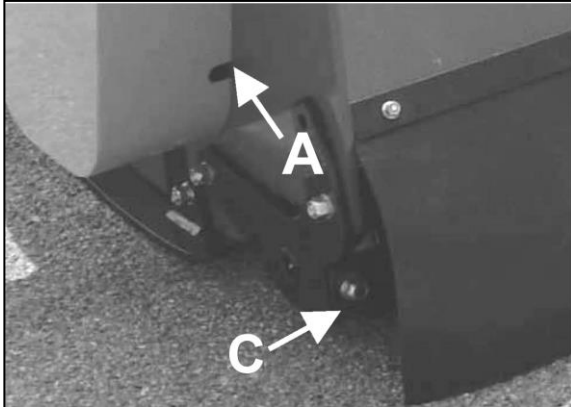
Every 12 months

- ✓ Change gearbox oil

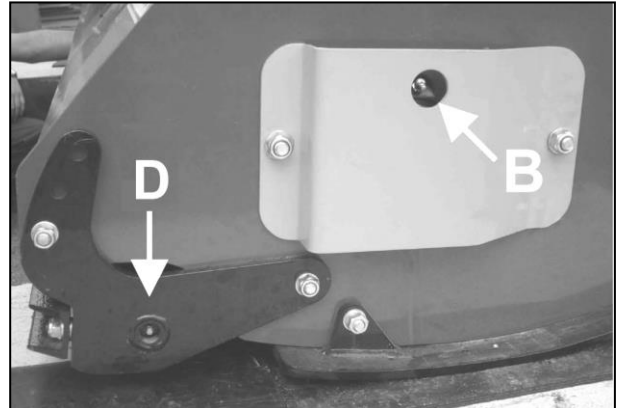
RHD Series RHD 230/250/280

Grease Points

Lubricate the points indicated below using type LIS 3 grease.



- A. Rotor Shaft L/H Bearing
- C. Rear Roller L/H Bearing



- B. Rotor Shaft R/H Bearing
- D. Rear Roller R/H Bearing

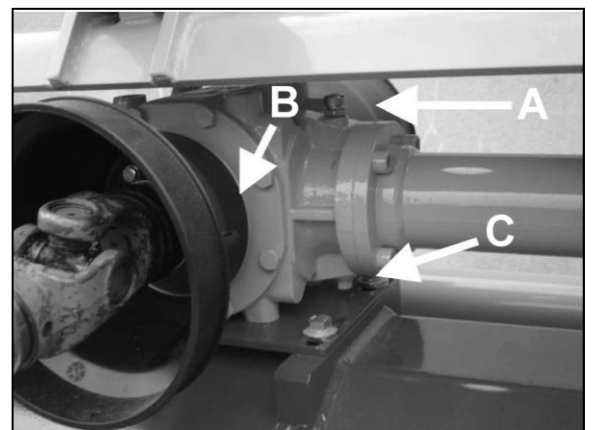
Gearbox Lubrication

The illustrations opposite show the lubrication access points for the gearbox and the half shaft drive.

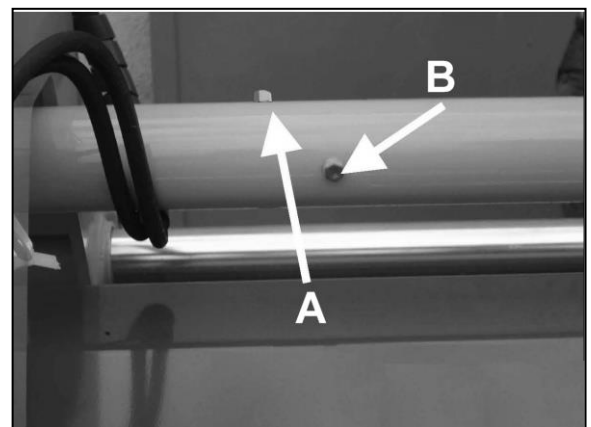
- A. Filler Plug
- B. Level Plug
- C. Drain Plug

Lubricant level should be checked on a daily basis during work and topped up only if required.

Checking the level is by removal of plug 'B' – lubricant should be inline with the bottom of this aperture. Topping up the lubricant is performed via filler plug 'A' to a point where the oil starts to drip out of plug 'B' aperture. Replace and tighten the plugs before using the machine. Gearbox oil should be replaced annually – draining the gearbox is via plug 'C'.



Gearbox - lubrication access points



Half Shaft - lubrication access points

Capacities & Lubricant

Gearbox

1.5 Litre SAE90 – *All models*

Half Shaft

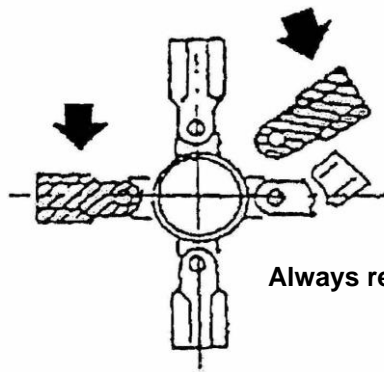
0.9 Litre SAE90 – *Euro 230 & Euro 250 models*

1.3 Litre SAE90 – *Euro 280 model*

Flail Replacement

The rotor and flails should be inspected for wear or damage on a regular basis – missing, damaged or worn flails should be replaced immediately. When replacing a flail the diametrically opposite flail should also be replaced at the same time in order to maintain rotor balance.

DANGER: Machine and tractor should be switched off and the starting key removed at all times when inspecting or maintaining the machine – Never work on a machine that is switch on and running.



Always replace flails in opposing pairs

Rotor Vibration

If vibration of the rotor is experienced the machine should be stopped immediately – this is often a sign that a flail is either missing or severely damaged, if this is the case do not use the machine until the problem has been rectified. If vibration continues, or occurs for no apparent reason, the rotor must be checked and, if necessary, rebalanced before using the machine again. Contact your local dealer for further advice or assistance on this subject.

RHD Series RHD 230/250/280

Troubleshooting

PROBLEM	POSSIBLE CAUSES	REMEDIES
Irregular Cut	Worn, bent or broken flails	<i>Replace flails</i>
	RPM too low	<i>Increase RPM</i>
	Machine not level to the ground	<i>Correct mounting on tractor</i>
	Clogged material caused by excessive forward speed	<i>Reduce forward speed</i>
Noise	Loose bolts	<i>Check and tighten bolts</i>
	Damaged components	<i>Repair or replace</i>
Noisy gearbox	Lack of lubrication	<i>Top up oil to correct level</i>
	Worn gears	<i>Replace worn components</i>
	Worn bearings	<i>Replace worn components</i>
Vibration	Broken, worn or missing flails	<i>Replace flails</i>
	Rotor out of balance	<i>Balance or replace rotor</i>
	Worn rotor bearings	<i>Replace rotor bearings</i>
Excessive backlash in joints	Worn pins	<i>Replace pins</i>
Tight bearings	Bearings dirty or ungreased	<i>Clean and grease</i>
	Violent lowering down of machine	<i>Lower machine gently</i>
Belts overheating	Belts slipping on pulleys	<i>Tension belts</i>
	Flails contacting the ground	<i>Raise cutting height</i>
	Working speed too high	<i>Reduce working speed</i>

Machine Disposal

Disposal of this machine and any of its component parts must be performed in a responsible and inoffensive manner respecting all current laws relating to this subject. Materials forming this machine that must undergo differentiated division and disposal are:

- Steel
- Mineral Oil
- Rubber
- Plastic

Spearhead

RHD Series Flail Mowers

RHD 230/250/280

Parts Manual

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)

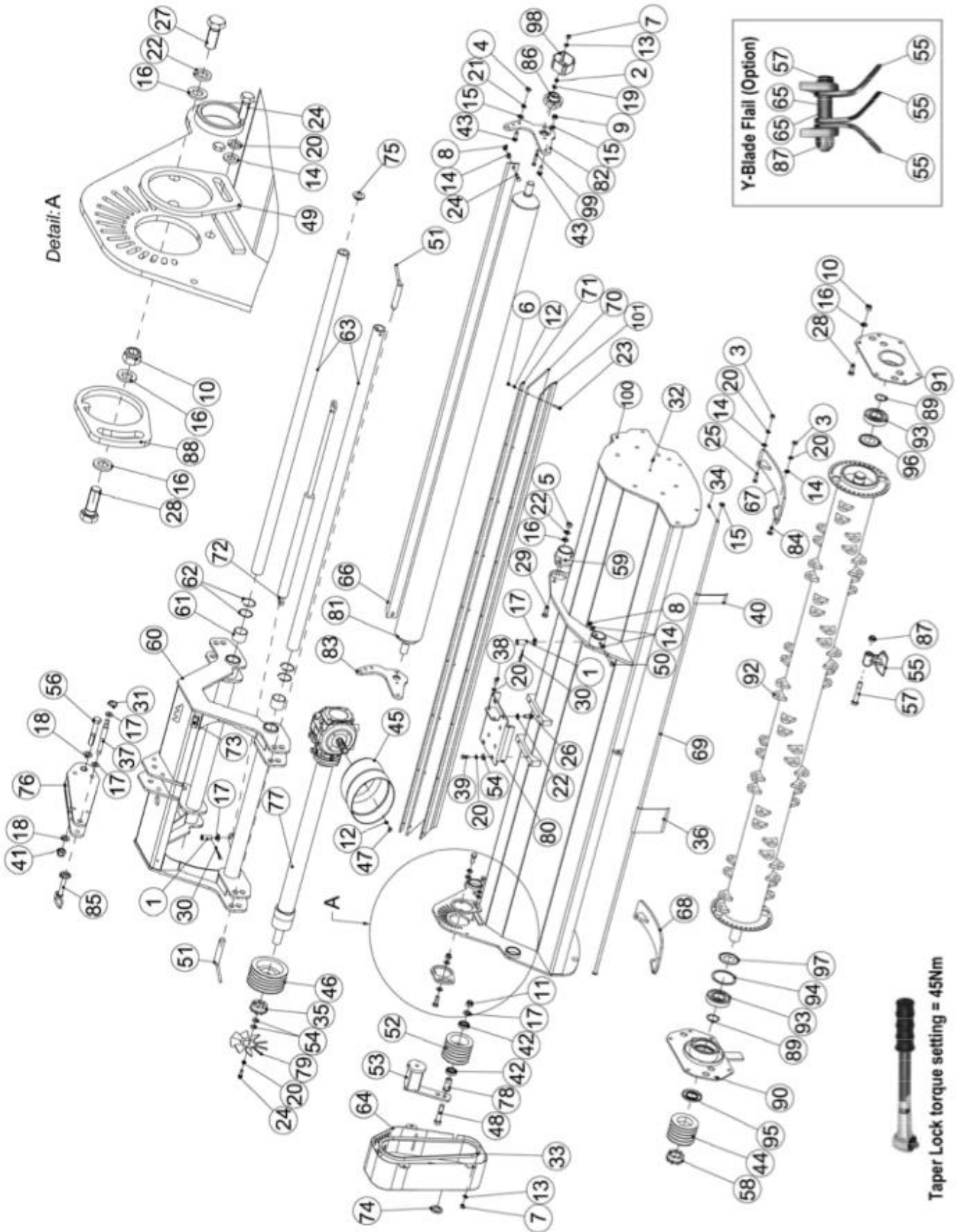
Delivery is normally via carrier direct to your dealer.

Services that are currently available are Next Day, with the additional option of before 9.00 am, 10.30 am or Noon.

Carriers also offer a 2-3 day service for heavier items. For light and small parts, these can be posted first or second-class mail.

RHD Series RHD 230/250/280

Flail Body & Headstock



RHD Series RHD 230/250/280

ITEM NO.	PART NO.	DESCRIPTION.	QUANTITY.		
			230	250	280
1	1061532	PIVOT PIN	2	2	2
2	9113005	NUT	4	4	4
3	9113006	NUT	4	4	4
4	1061121	NUT	2	2	2
5	9113007	NUT	2	2	2
6	9163004	SELF-LOCKING NUT	7	8	9
7	9163005	SELF-LOCKING NUT	4	4	4
8	9163006	SELF-LOCKING NUT	4	4	4
9	1061042	SELF-LOCKING NUT	2	2	2
10	9163007	SELF-LOCKING NUT	13	13	13
11	9163008	SELF-LOCKING NUT	1	1	1
12	9100104	WASHER	15	16	17
13	9100105	WASHER	1	1	1
14	9100106	WASHER	15	19	21
15	05.281.14	WASHER	9	9	9
16	9100106	WASHER	17	17	17
17	9100108	WASHER	5	5	5
18	9100109	WASHER	5	5	5
19	9100205	SPRING WASHER	4	4	4
20	9100208	SPRING WASHER	12	12	12
21	05.282.08	SPRING WASHER	2	2	2
22	9100206	SPRING WASHER	7	7	7
23	9313074	BOLT	7	8	9
24	9313076	BOLT	4	4	4
25	9213086	BOLT	2	2	2
26	9313067	BOLT	4	4	4
27	9313087	BOLT	1	1	1
28	9313097	BOLT	13	13	13
29	9313107	BOLT	2	2	2
30	1061076	PIN	2	2	2
31	1061097	LYNCH PIN	1	1	1
32	1061079	GREASE NIPPLE	2	2	2
33	21233.01	BELT	4	5	5
34	1061077	SPLIT PIN	1	1	1
35	1061165	CLUTCH ELVE	1	1	1
36	1061171	FLAP	16	12	19
37	1061168	PIN	1	1	1
38	9313056	BOLT	2	2	2
39	9313066	BOLT	4	4	4
40	1061482	FLAP (50mm)	-	-	1
	1061170	FLAP (70mm)	-	1	-
	1061098	FLAP (130mm)	-	5	-
41	9163009	NUT	1	1	1
42	1061336	BEARING	2	2	2
43	9213165	BOLT	4	4	4
44	1061113	PULLEY 130/80-4	1	-	-
	1061479	PULLEY 130/80-5	-	1	1

RHD Series RHD 230/250/280

ITEM NO.	PART NO.	DESCRIPTION.	QUANTITY.		
			230	250	280
45	1061246	PVC SHAFT GUARD	2	2	2
46	1061114	PULLEY 180/80-4	1	-	-
	1061414	PULLEY 180/80-5	-	1	1
47	1061531	BOLT	8	8	8
48	1061556	BOLT	1	-	-
	1061555	BOLT	-	1	1
49	1061142	FLANGE	1	1	1
50	9213206	BOLT	2	2	2
51	1061268	PIVOT PIN	2	2	2
52	1061049	STRAIN PULLEY 130/4	1	-	-
	1061335	STRAIN PULLEY 130/5	-	1	1
53	1061539	BELT TENSIONER	1	1	1
54	1062112	WASHER (THICK)	-	-	4
55	1061371	HAMMER FLAIL	26	28	32
	1061034	Y-BLADE FLAIL (OPTION)	78	84	96
56	1061557	BOLT	1	1	1
57	1061530	BOLT	26	28	32
58	1061490	CLUTCH ELVE	1	1	1
59	1061572	BUSHING	1	1	1
60	1061567	LINKAGE - LH	1	1	1
61	1061493	BUSHING	4	4	4
62	1061494	CIRCLIP	4	4	4
63	1061496	SLIDING TUBE	-	-	2
	1061495	SLIDING TUBE	2	2	-
64	1061529	BELT SHIELD - LH	1	1	1
65	1061501	SPACER	52	56	64
66	1061507	SCRAPER – RHD 230	1	-	-
	1061508	SCRAPER – RHD 250	-	1	-
	1061509	SCRAPER – RHD 280	-	-	1
67	1061510	SKID (LEFT)	1	1	1
68	1061511	SKID (RIGHT)	1	1	1
69	1061512	FLAP BAR – RHD 230	1	-	-
	1061513	FLAP BAR – RHD 250	-	1	-
	1061514	FLAP BAR – RHD 280	-	-	1
70	1061515	RUBBER GUARD – RHD 230	1	-	-
	1061516	RUBBER GUARD – RHD 250	-	1	-
	1061517	RUBBER GUARD – RHD 280	-	-	1
71	1061518	BAR (RUBBER GUARD) – RHD 230	1	-	-
	1061519	BAR (RUBBER GUARD) – RHD 250	-	1	-
	1061520	BAR (RUBBER GUARD) – RHD 280	-	-	1
72	1061523	HYDRAULIC CYLINDER	1	1	1
73	1061559	CLAMP	1	1	1
74	1062046	BELT SHIELD CAP	1	1	1
75	1061561	CAP	4	4	4
76	1061562	UPPER LINKAGE	1	1	1
77	1061575	GEARBOX 312 950 - LH	1	1	-
	1061574	GEARBOX 312 1200 - LH	-	-	1

RHD Series RHD 230/250/280

ITEM NO.	PART NO.	DESCRIPTION.	QUANTITY		
			230	250	280
78	1061622	BUSHING FOR STRAIN PULLEY	1	-	-
	1061565	BUSHING FOR STRAIN PULLEY	-	1	1
79	1061566	FAN	1	1	1
80	1061689	GEARBOX PLATE - LH	1	1	1
81	1061698	REAR ROLLER – RHD 230	1	-	-
	1061697	REAR ROLLER – RHD 250	-	1	-
	1061696	REAR ROLLER – RHD 280	-	-	1
82	1061699	REAR ROLLER BRACKET - LH	1	1	1
83	1062001	REAR ROLLER BRACKET - RH	1	1	1
84	9213086	BOLT	2	2	2
85	1062172	PIN c/w CHAIN	1	1	1
86	1062138	BEARING & CASING	2	2	2
87	1062173	NUT	26	28	32
88	1062174	FLANGE	1	1	1
89	1062175	EXTERNAL CIRCLIP	2	2	2
90	1062176	BEARING CASING (L)	1	1	1
91	1062177	BEARING CASING (R)	1	1	1
92	1062178	ROTOR SHAFT c/w BEARING – RHD 230 UP TO 2017	1	-	-
	1062292	ROTOR SHAFT c/w BEARING – RHD 230 2017-ON	1	-	-
	1062179	ROTOR SHAFT c/w BEARING – RHD 250 UP TO 2017	-	1	-
	1062293	ROTOR SHAFT c/w BEARING – RHD 250 2017-ON	-	1	-
	1062180	ROTOR SHAFT c/w BEARING – RHD 280 UP TO 2017	-	-	1
	1062294	ROTOR SHAFT c/w BEARING – RHD 280 2017-ON	-	-	1
93	1062181	BEARING	2	2	2
94	1062182	INTERNAL CIRCLIP	1	1	1
95	1062183	OIL WASHER	1	1	1
96	1062184	WASHER	1	1	1
97	1062185	WASHER	1	1	1
98	1062186	BEARING GUARD	2	2	2
99	1062187	BOLT	4	4	4
100	1062188	FRAME – RHD 230 LH	1	-	-
	1062189	FRAME – RHD 250 LH	-	1	-
	1062190	FRAME – RHD 280 LH	-	-	1
101	1062191	FLAP SUPPORT – RHD 230	1	-	-
	1062192	FLAP SUPPORT – RHD 250	-	1	-
	1062193	FLAP SUPPORT – RHD 280	-	-	1
*	1061581	HYDRAULIC OFFSETTING PIPES (2000)	1	1	1
*	1061582	HYDRAULIC OFFSETTING PIPES (2500)	1	1	1
*	42695.12	PTO SHAFT	1	1	1

* Components not illustrated

RHD Series RHD 230/250/280

RHD Series RHD 230/250/280

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