

# Spearhead

## RHD OPEN SERIES 230/250/280 Flail Mowers



Edition 1.3 - August 2016  
Part No. 8999072

## HANDBOOK & PARTS MANUAL

**Spearhead**  
**RHD Series Flail Mowers**  
**RHD OPEN**  
**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](http://www.spearheadmachinery.com), log onto 'Dealer Inside' and select the 'Machine Registration button' which can be found in the Service Section of the site. Confirm to the customer that the machine has been registered in the section below.

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

Registration Verification

Dealer Name: .....

Dealer Address: .....

Customer Name: .....

Date of Warranty Registration: ...../...../..... Dealer Signature: .....

#### NOTE TO CUSTOMER / OWNER

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

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

**CAUTION: DO NOT OVER TORQUE HYDRAULIC FITTINGS AND HOSES.**

#### TORQUE SETTINGS FOR HYDRAULIC FITTINGS

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

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

## WARRANTY POLICY

### WARRANTY REGISTRATION

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

#### 1. LIMITED WARRANTIES

- 1.01. All machines supplied by Spearhead Machinery Limited are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months, unless a different period is specified.
- 1.02. All spare parts supplied by Spearhead Machinery Limited are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months.
- 1.03. The manufacturer will replace or repair for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined.
- 1.04. This warranty does not apply to any part of the goods, which has been subjected to improper or abnormal use, negligence, alteration, modification, fitment of non-genuine parts, accident damage, or damage resulting from contact with overhead power lines, damage caused by foreign objects (e.g. stones, iron, material other than vegetation), failure due to lack of maintenance, use of incorrect oil or lubricants, contamination of the oil, or which has served its normal life. This warranty does not apply to any expendable items such as blades, flails, bushes, belts, flap kits, skids, shields, guards, wear pads or pneumatic tyres.
- 1.05. Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.
- 1.06. Warranty on hoses is limited to 12 months and does not include hoses which have suffered external damage. Only complete hoses may be returned under warranty, any which have been cut or repaired will be rejected.
- 1.07. Machines must be repaired immediately a problem arises. Continued use of the machine after a problem has occurred can result in further component failures, for which Spearhead Machinery Ltd cannot be held liable, and may have safety implications.
- 1.08. Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of Spearhead Machinery Ltd.
- 1.09. For machine warranty periods in excess of 12 months the following additional exclusions shall apply:
  - 1.09.1. Hoses, external seals, exposed pipes and hydraulic tank breathers.
  - 1.09.2. Filters
  - 1.09.3. Rubber mountings
  - 1.09.4. External electric wiring.
  - 1.09.5. Labour and mileage costs.
- 1.10. All service work, particularly filter changes, must be carried out in accordance with the manufacturer's service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.

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

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## **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.

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## 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**

.....

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## 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 and purpose of use

The RHD OPEN 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 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.*



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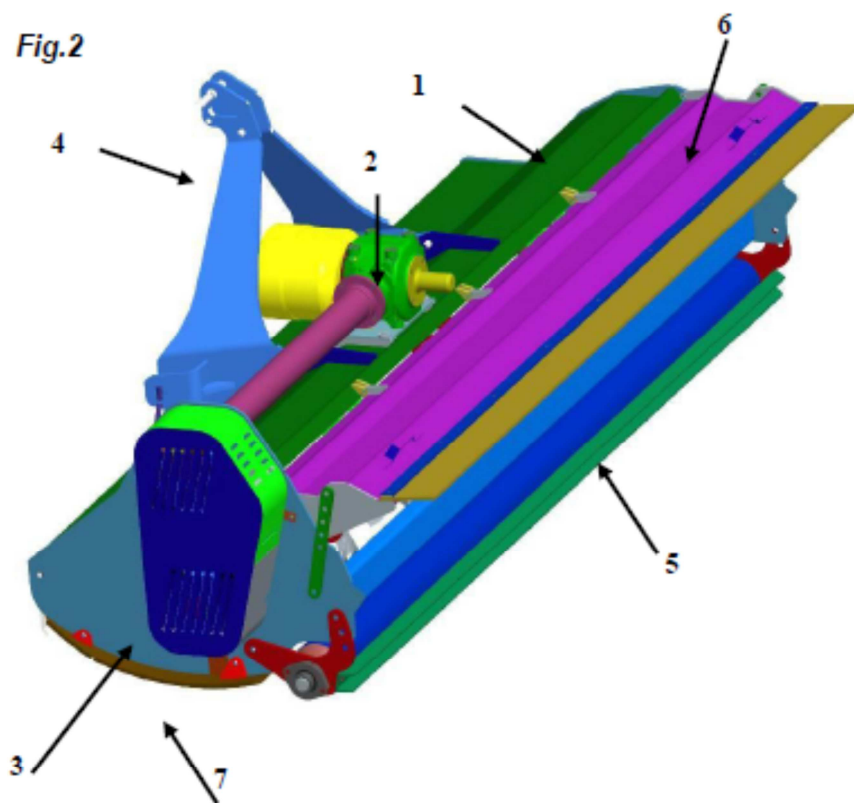
## Machine Identification

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



- |                    |                |
|--------------------|----------------|
| 1. frame           | 5. rear roller |
| 2. gear box        | 6. rear gate   |
| 3. belt drive      | 7. skid        |
| 4. 3-point linkage |                |

## Noise

The sound level of this machine, as measured at the operator's ear, ranges from 70 to 90 dB when the rear window of tractor is open. We recommend the use of ear protectors

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## Technical Specification

TYPE		OPEN 230	OPEN 250	OPEN 280
Working Width	cm	228	244	277
Tractor Min Power	HP	55-60	65-75	75-85
Tractor Max Power	HP	110	110	110
RPM	Min <sup>-1</sup>	1000	1000	1000
Y-Blades	Nr	78	84	96
Hammers	Nr	26	28	32
Weight	kg	780	815	865
Offsetting	cm	50	50	50
Linkage	CAT	II	II	II
Width	mm	2510	2670	3000
Length	mm	1010	1010	1010
Height	mm	1050	1050	1050
Rotor Shaft RPM	Min <sup>-1</sup>	2243	2243	2243

### 2.3 Optional Equipment

According to the working conditions we recommend the following additional equipment

- Y blade (for cutting material till max 3cm in diameter)
- Hammers (for cutting material till max 5cm in diameter)

**Maximum thickness of the material depends on the sort and hardness of the wood.  
Up-mentioned diameters are valid for fresh wood only.**

## Safety



### 3.1 General safety rules

1. Before starting, checks on the tractor and the machine must be carried out as regards: functionality, road safety, accident prevention rules.
2. Together with the operating and maintenance rules for the machine it is necessary to consider general health and security rules and warnings.
3. Before starting it is mandatory to know everything regarding the equipment and operating of the machine. Reading instructions among operating is too late.
4. Security and warning decals on the machine are very important. Respect them always.
5. Even when using the machine correctly, stones or other objects may be thrown on a long distance. Therefore nobody must stand within the danger area. Special attention must be paid when working near roads or buildings.
6. Use tractor with the cabin.
7. Whenever using public roads, respect traffic rules.
8. Never wear loose or fluttering clothes.
9. Keep the machine clean to avoid fire danger.
10. Before starting check the surrounding area for the likely presence of children and/or animals.
11. Never carry passengers on the machine.

12. At connecting the machine on the tractor put a support foot into the working position (up). After removal put the support foot into the standing position (down). Take care about the stability of the machine when it is removed.
13. Never overload the machine and the tractor. Use the ballast if necessary.
14. Start the machine only if all guards of the machine are fit on proper places .
15. It is forbidden to stand in the range of operating of the machine.
16. Do not enter the working zone of the PTO shaft. It is dangerous to approach the rotating parts of the machine.
17. Keep a safety distance from drive parts outside of the machine (PTO shaft, hydraulic pipes).
18. Before leaving the tractor with the machine attached disconnect the tractor, put the machine steadily on the ground (with the hydraulic lift), apply the hand brake and if the ground is steeply slooping, wedge the tractor. Take out the starting key.
19. Do not enter the zone between the tractor and the machine. It is strongly forbidden to be in this zone if the tractor is not properly disconnected, hand brake applied and starting key taken out.



## **3.2 Attachment on the tractor and transport**

1. Before attaching the machine on or detaching it of the tractor be sure that hydraulic lift system is in a neutral position.

2. check that a category of 3-point linkage on the tractor corresponds to that one on the machine.
3. Be careful! There is a danger of injuries when working near or with 3-point linkage.
4. It is forbidden to be in the zone between the tractor and the machine while working with the hydraulics.
5. Put the 3-point linkage into the position that moving of the machine during transport is not possible.
6. During transport secure the lever of hydraulic lift to avoid any unplanned moving the machine.
7. It is mandatory to install a horizontal blockade during transport and at bigger machines a vertical blockade must be installed, too.
8. Never leave the tractor cab when the tractor is working.
9. Adjust driving speed to the road conditions.



### **3.3 PTO drive**

1. Use only PTO shafts with all guards, as directed by the producer.
2. All guards on PTO shaft must be in good order .
3. Take care that all guards on the PTO shaft are in proper position during transport or operating. Respect the producer's instructions.
4. The PTO shaft must be assembled or diassambled only with the engine stopped and the starting key removed.
5. Take care that PTO shaft is correctly fitted on and correctly secured.
6. The guards of the PTO shaft must be fixed to the machine and to the tractor with chains, to prevent rotation.

7. Before starting always check that the speed and the rotational direction correspond to those on the machine.
8. At some tractors a number of rotations depends on the speed and a direction of rotating depends on the direction of driving. Take care about that.
9. Before starting the PTO shaft be sure, that noone is in the danger area.
10. Never try to start the PTO shaft when the tractor engine is disconnected.
11. It is forbidden to be in the zone of drive axle exit, when it is engaged.
12. After the drive is disconnected wait that the drive axle stops to rotate completely. Never approach before it stops.
13. Never carry out maintenance of a machine or tractor whilst the engine is running. The engine should be switched off and the key removed.
14. If the PTO shaft is damaged, immediately stop with any operating.



## **3.4 Hydraulic system**

1. Take care! Hydraulics is under very high pressure.
2. At connecting the pipes on the tractor check that the pressure is not too low.
3. Hydraulic connections must be marked to avoid wrong connection. And consequently changing of the operation (lifting instead of lowering and vice versa).
4. We recommend that an official service tests the pipes before operating and than at least ones per year. Damaged

or worn pipes should be replaced immediately with others of the same specification.

5. at checking pipes it is necessary to wear protection clothes and gloves to avoid injuries.
6. The oil under high pressure may sweep into the skin causing serious infections. In this case contact a doctor immediately.
7. Before working on the hydraulic system lower the machine, take pressure out and stop the tractor.
8. Approximate using period of the pipes is 6 years. After that the pipes should be replaced to avoid any damage.
9. Used oils and greases must be stored and disposed of according to antipollution rules.



### 3.5 Safety rules during use

1. Never start or continue to work with the machine if the tractor or the drive axle are engaged
2. Always remove the starting key after you stopped the tractor.
3. Periodically check that bolts and nuts are tighten properly.
4. At maintaining it is sometimes necessary to lift the machine. It is mandatory to put under the machine an appropriate support to avoid falling the machine at eventual damage on hydraulics.
5. Use the gloves and appropriate tools at changing sharp parts of the machine to avoid injuries.

6. Used oils and greases should be removed according to the rules.
7. Always disconnect electric cables on the tractor before any welding or other operation when using electricity is necessary.
8. Only original spare parts should be installed.

## 3.6 Warning decals



1. Always take off previously the machine of the tractor and read the instructions carefully before starting servicing and or lubrication operations.



2. Keep at a safety distance from the machine to avoid the risk of projection of objects.



3. Never remove the guards while the parts of the machine are moving. It is dangerous to injure the hands.



4. Keep at a safety distance from the machine to avoid the risk of cutting the feet.



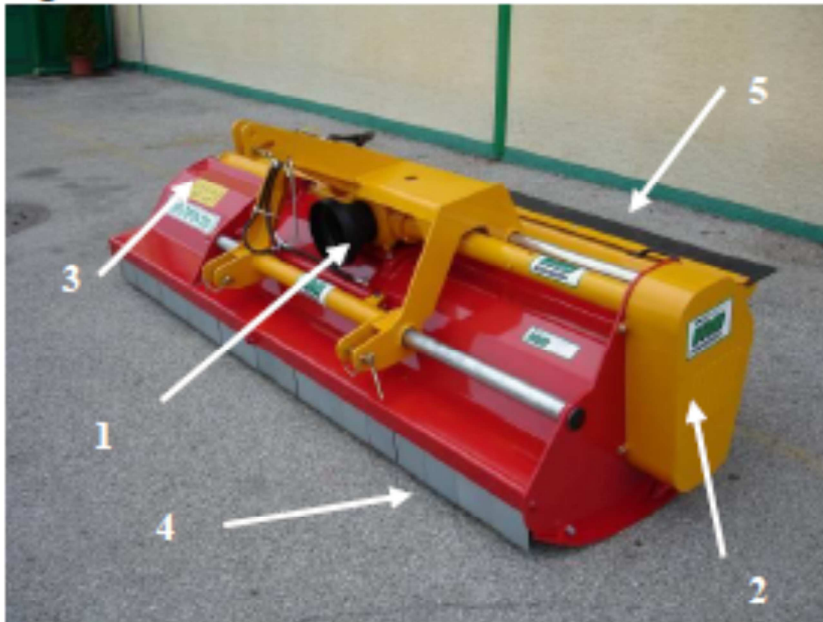
5. It is forbidden to mount on the machine because of the risk of fall



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## List of Guards

Fig. 3



- |                     |                     |
|---------------------|---------------------|
| 1. PTO shaft shield | 4. Protecting flaps |
| 2. belt shield      | 5. Rubber guard     |
| 3. warning decals   |                     |

## 4. Description and operating of the machine

Standard machine is rear mounted. As an option the machines can be also front mounted (Fig.4), rear and front mounted (Fig.5) and rear and front mounted with 2-linkages (Fig.6).

Optionally a side mounted rotary cutter can be mounted on one or both sides of the machine.(Fig.7).

Fig. 4

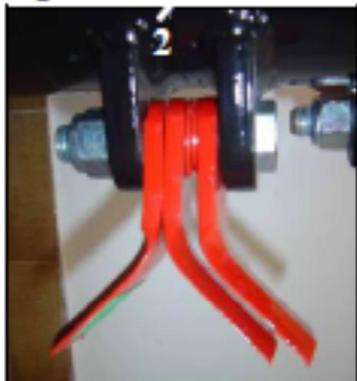


Fig. 5



Fig.6



Operator manuals are made for all types of the machine.  
All special details are described for each type separately.

## 5. Transport and attachment of the machine

### Transport to the customer

Unload the machine with special care to avoid any damage. For unloading use special bolt on gearbox (Fig.11). Check that all nuts and bolts are fixed and tightened. Specially check the bolts and nuts for the working blades.

### 5.2. Attachment and detachment from the tractor

Before any operation check:

- That the machine is in good condition,
- That all guards are on proper places and in good condition,
- That working blades are complete and undamaged,
- That all greasing points are greased well and that in gearbox is oil enough,
- Appropriate tensioned belts,
- That rpm and direction of rotation on the drive axle correspond to those on the machine.

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To attach the machine to the tractor, bring the tractor lower lines near the machine, to the points corresponding to the pins. Insert the pins and secure them with the spring clips. Fit the top link, raise the machine to a perpendicular position with the ground. Adjust the two tractor lower linkage stabilizers thus fixing the machine to the tractor in a central position. Connect the hydraulic cylinders and check if it works.



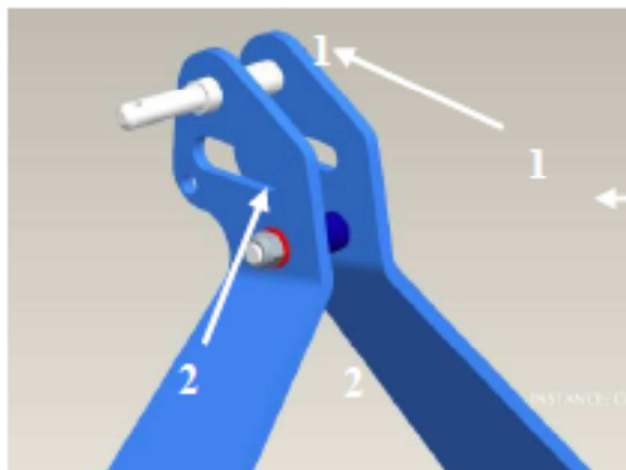
3-point hitch of the machine must be in a symmetrical position with the tractor.

Top linkage point has two working modes: floating (Fig.7/2) and fixed one (7/1). We can use fixed position on an even ground while on an uneven ground floating position is obligatory to prevent the machine against damage.



Always check that rpm and direction of rotation on tractor and flail mower are the same.

*Fig.7*



## 5.3 Fitting the PTO shaft

Attach the machine on the tractor. Split the tubes into both parts and put one part on the tractor and another on the machine. At the machine laying on the ground, minimum overlapping of the tubes mustn't be less than 1/3 of total length. Cut too long part of the tube

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and clean the edges. Cut on the proper length also the guard as on fig.9. Measure the length when the PTO shaft is in horizontal position. Grease before putting them together.

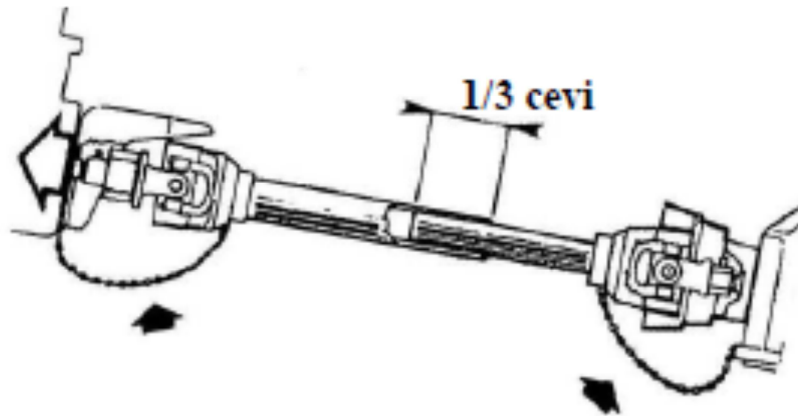


Too long PTO shaft can seriously damage tractor or flail mower.

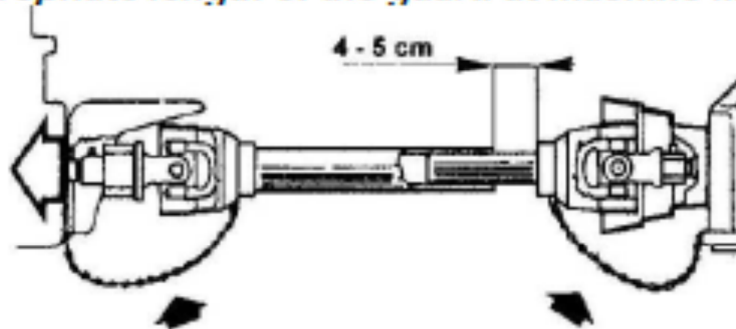


Never put PTO shaft on the tractor without all guards.

*Fig. 8: Appropriate length of PTO shaft at the machine on the ground*



*Fig.9: Appropriate length of the guard at machine lifted.*



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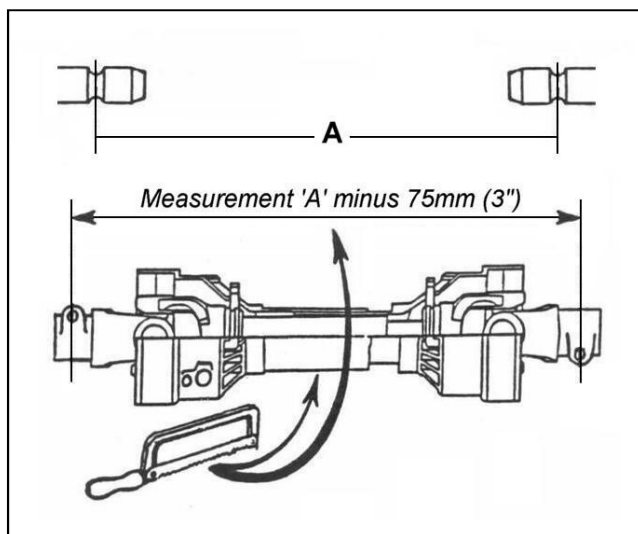
## PTO Shaft Measurement

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:

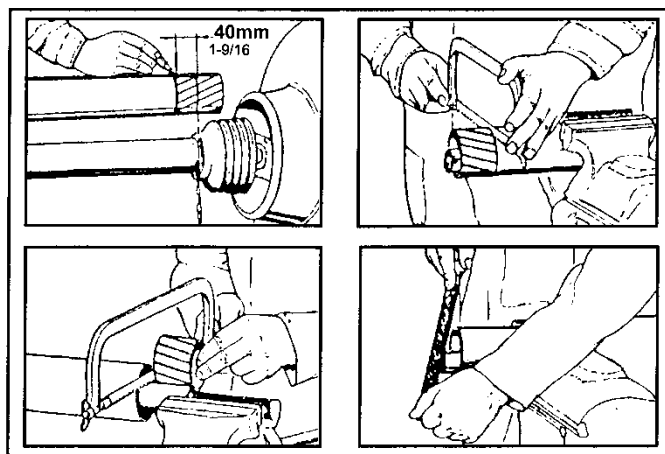
*For subsequent use with different tractors measure again, there must be a minimum shaft overlap of 150mm (6").*

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.



## 5.4 Tractor stability



**At attachment of the machine on the tractor always take care about allowed weight of the attachment and axle load. First axle of the tractor should always be loaded with min.20% of the weight of the tractor itself.**

Fig. 10



## Adjusting and Setting Up

### 6. Adjustment and setting up

#### 6.1 Regulation of the height of cut

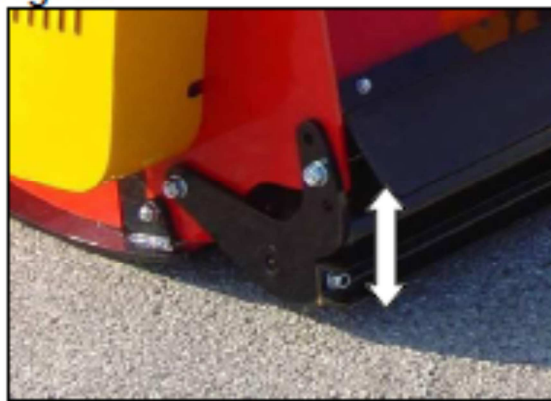
Height of cut depends on working conditions and volume of the material. The height of cut can be regulated with the hydraulic system on the tractor or/and with adjusted rear roller of the machine (Fig. 12).

The min. height of cut should be between 1-3 cm. The machine always run on the rear roller and not on the skids.

Fig. 11



Fig. 12



Working tools never touch the ground. The skids are only the protection against injures. They do not touch the ground.

#### 6.2 Offsetting

the machine has in standard equipment a mechanic offsetting (Fig.13).

Fig. 13



## 6.3 Belt tension adjustment

Appropriate belt tension is one of conditions for optimal operating of the machine and for long lasting of the belts themselves. For this purpose the machine has manual strain pulley incorporated.

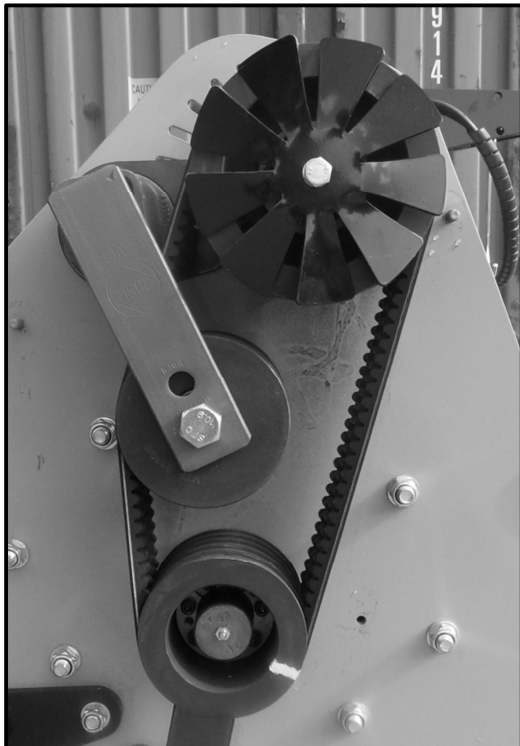


Fig.15



After 2 hours of operating it is obligatory to check and tension the bolts of elve clutch (taper lock) (Fig.15). Tension the bolts always in the circle. Tension the bolts at least 4 times, whenever it is still possibly manually to tension them.

## Operating the Machine

### 7. Operating



Before starting check the terrain first for some stones, wood and other.



If there is no other sign, max rpm of PTO shaft is 540 rpm.



In the case of damage on the rotor shaft uncontrolled vibrations appear and consequently injuries on other parts of the machine (weld crackings) if we continue with work. Therefore it is necessary in such case to stop the machine immediately, stop the cardan shaft, check the rotor shaft and change damaged and missing parts (see chapter 9.6). If the rotor shaft after changing still runs unequally, it is necessary to balance it (contact servicing dept).



Before starting lift the machine for 10 cm. After starting the machine, put it on the ground into the working position gently.

Fig. 18



Working speed depends on working conditions and on the material cut. Optimal speed is between 3-8 km/h. In the case of much more dense grass or other material, it is obligatory to reduce the speed to avoid slipping of the belts.



Fig. 19



During reverse movement lift the machine off the ground to avoid damaging it. (Fig. 19)!



During turning lift the machine.

## 8. After the job done

After the job done disconnect the PTO shaft, lift the machine and transport it onto the appropriate place.



During transport reduce the speed, especially on bumpy roads. The weight of the machine may render driving difficult and damage the machine itself. During transport the machine must be always in the central position.



Check the condition of the rotor shaft, working blades and if they are tightened well (nuts, washers).



PTO shaft must be disconnected during transport.



At disconnecting the machine respect the warning rules for connecting the machine.

# Spearhead RHD OPEN 230/250/280

Put the machine on the flat not soft ground. Put the support foot into the appropriate position. To avoid a corrosion store the machine on a dry place.

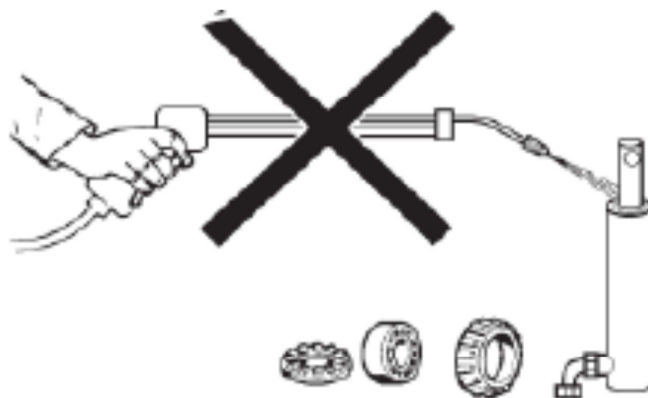


At disconnecting the machine from the tractor block the rear roller with a piece of wood for stability of the machine.

## 8.1 Cleaning

To avoid any corrosion clean the machine after each working day, especially working tools, bearings etc. Be careful to avoid damaging hydraulic pipes, bearings and colour.

Fig. 20



## 9. Maintenance



All maintenance, cleaning and repair operations must be carried out with the machine firmly lowered to the ground and detached from the tractor, or with disconnected PTO, engine off and starting key out.



A time of maintenance is defined according to the normal use of the machine. If the machine is used in very hard conditions, the time between maintenance operations must be shorter.



Take care that grease nipples on the machine are always clean.



After each maintenance operation check that all guards are fitted on the proper place.

## 9.1. Belt tension adjustment

Belts are adjusted with automatic strain pulley.



Appropriate belt tension is achieved when at pressing on the belts with the force of 100 N (i.e. 10 kg), we reach a deviation of the belt 1,5 cm.

## 9.2. Oil level control

Use always the same type of oil, SAE 90. Use the hole on the top of gearbox for filling in (Fig. 21/2) and on the top of the half axle (Fig.22/4). You need cca 3 l of oil. For pouring in use a funnel. Pour in the oil till the level of the control plug on the gearbox and on the half axle. (Fig.21/3, 22/5). A plug for oil control is placed under the PVC shield for PTO shaft on the gearbox. At changing oil unscrew the plug under the gearbox and let the oil off (Fig. 21/1).

Fig. 21

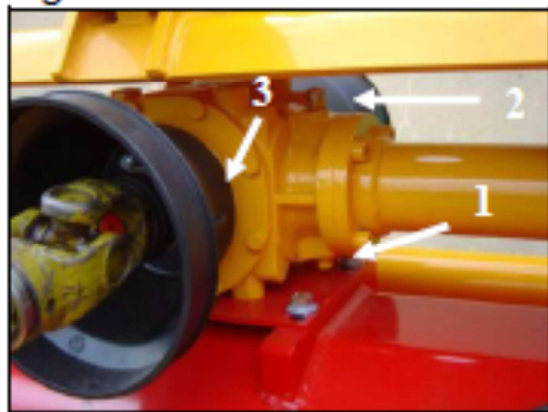
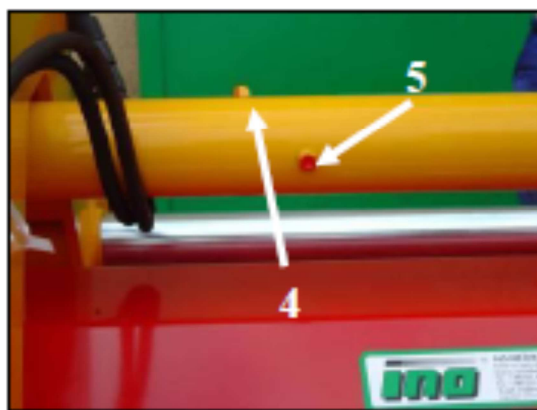


Fig. 22



## 9.3 Greasing



Before any greasing operation read these instructions first.

The machine has the following greasing points:

- Left bearing on the rear roller (Fig. 23/2)
- Right bearing on the rear roller (Fig. 24/3)
- Left bearing on the rotor shaft (Fig.23/1)
- Right bearing on the rotor shaft (Fig.24/4)

Fig. 23

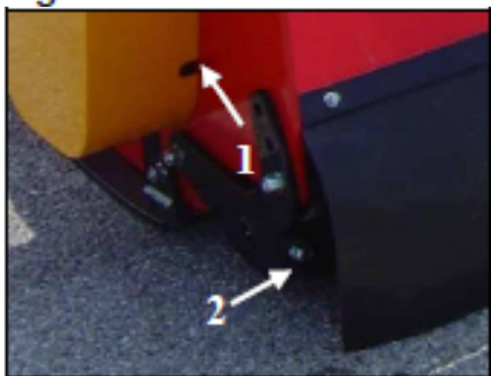
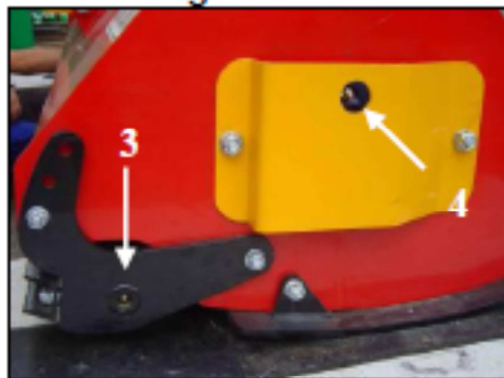


Fig. 24



At greasing use the gloves. After greasing always wash your hands.



Use type LIS 3 for greasing.

## 9.4. Plan for maintenance jobs

1. After first two hours of work always:
  - Check the belt tension
  - Check if all bolts and taper locks that are tightened enough.

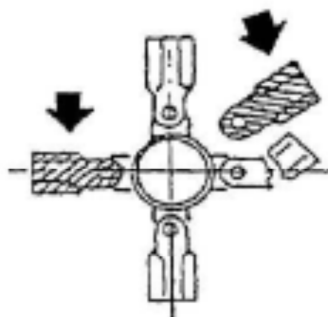
Do the same also after each belt changing.

2. After every 8 hours always check:
  - If the nuts are tightened enough,
  - A wear and condition of working tools,
  - Belts and taper locks,
  - A condition of safe guards,
  - Oil level in the gearbox,
  - That any foreign parts are not stuck on the rotor shaft,
  - That the frame and the 3-point hitch are in good condition
  - That all parts are greased well.
3. On every 100 hours we recommend to:
  - Check and grease the PTO shaft
4. On every 12 months we recommend to:
  - Change the oil in the gearbox.

## 9.5. Replacement of working tools

Immediately after you notice that working tools are damaged, change them. If it is necessary to change only few blades, always change the broken or worn one and the one diametrically opposite in order to maintain the balance. If the rotor shaft is vibrating after changing the blades, immediately stop the machine. The machine must be balanced before any work.

*Fig. 25*



## 9.6. At the end of the season

At the end of the season we recommend to clean the complete machine, change eventual broken or worn parts, tighten the bolts, the belts, grease the parts and oil the parts with damaged colour. Put the machine on a dry and flat ground.

## 9.7. Demolition when out of order

If the machine is out of order, all its parts that might cause dangers have to be made inoffensive. Materials, forming the machine that have to undergo a differentiated division, are:

- steel
- mineral oil
- rubber
- plastic

All the above mentioned operations and the disposal have to be carried out in total respect of the present provisions of law on the subject.

## Troubleshooting Guide

### 10. Trouble shooting chart

Trouble	Causes	Remedies
Irregular cut	Worn, bent or broken flails	Replace the flails
	Too low RPM	Increase RPM
	Machine is not in the level with the ground	Correct mounting on the tractor
Noise	Clogged material due to excessive working speed	Reduce the working speed
	Loosen bolts	Tighten the bolts
	Damaged parts of the machine	Find damages and repair the machine
Noise in the gearbox	Lack of oil	Fill till level
	Worn gears	Replace
	Worn bearings	Replace
Vibrations	Broken or worn flails	Replace
	Unbalanced rotor	Balance or replace
	Worn rotor bearings	Replace
Excessive backlash in joints	Worn pins	Replace
Damaged bearings	Dirty or ungreased bearings	Clean and grease
	Violant impact on the ground when the machine is lowered	Lower it gently
Belts overheating	Belts slipping	Tension the belts
	Working flails are touching the ground	Adjust the height of cut
	Too fast working speed	Reduce the speed

# **Spearhead**

## **RHD Series Flail Mowers**

### **RHD OPEN**

**230/250/280**

## **Parts Manual**



# Spearhead RHD OPEN 230/250/280

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## 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)

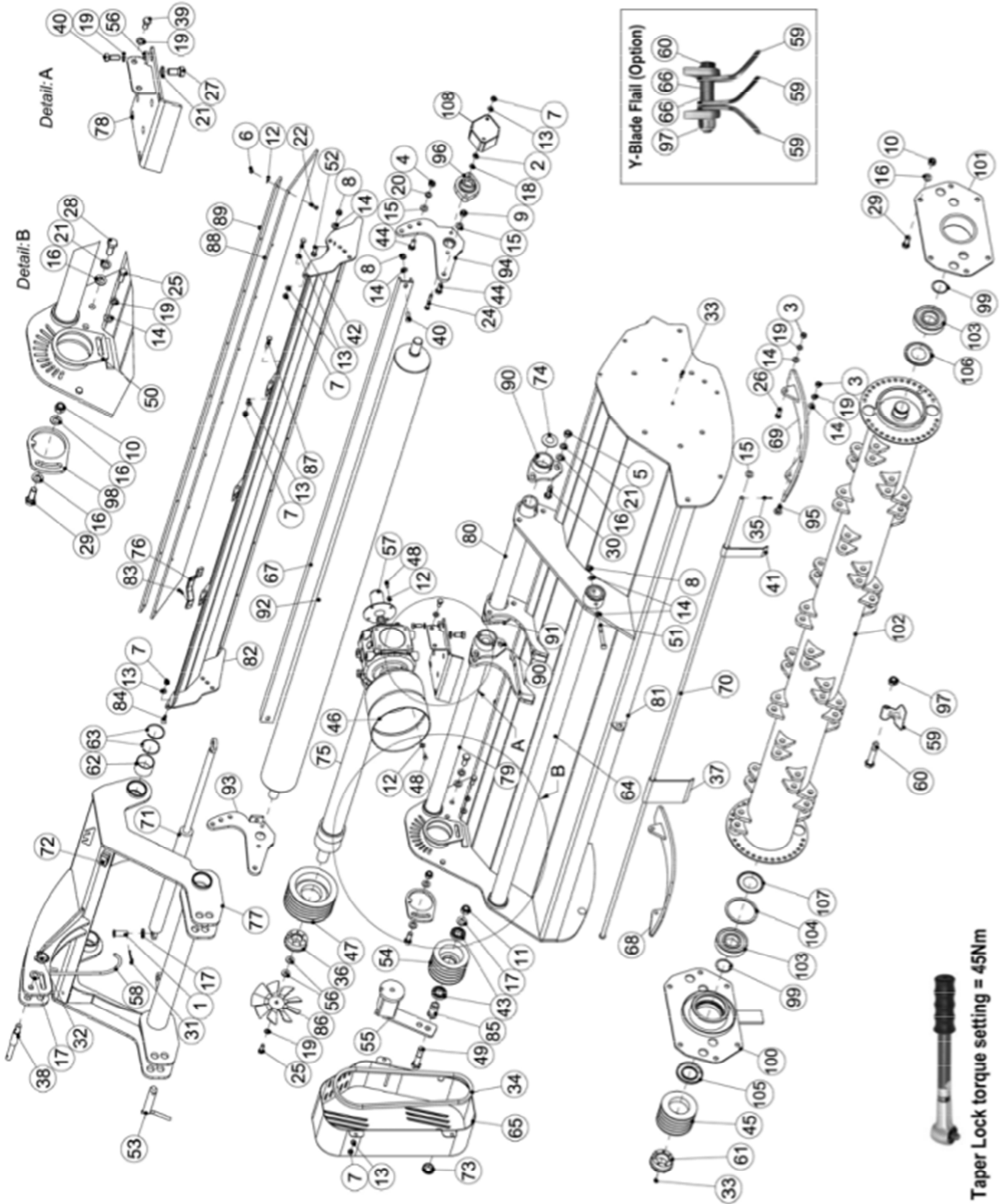
Delivery is normally via carrier direct to your dealer.

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.

# Spearhead RHD OPEN 230/250/280

## Flail Body and Headstock



# Spearhead RHD OPEN 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	6	6	6
6	9163004	SELF-LOCKING NUT	7	8	9
7	9163005	SELF-LOCKING NUT	11	11	11
8	9163006	SELF-LOCKING NUT	7	7	7
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	13	13	13
14	9100106	WASHER	13	13	13
15	05.281.14	WASHER	5	5	5
16	9100106	WASHER	21	21	21
17	9100108	WASHER	4	4	4
18	9100205	SPRING WASHER	5	5	5
19	9100206	SPRING WASHER	12	12	12
20	05.282.08	SPRING WASHER	2	2	2
21	9100207	SPRING WASHER	11	11	11
22	9213064	BOLT	7	8	9
23	9313045	BOLT	7	8	9
24	9213165	BOLT	4	4	4
25	9313076	BOLT	2	2	2
26	9213086	BOLT	2	2	2
27	9313067	BOLT	4	4	4
28	1061047	BOLT	1	1	1
29	9313097	BOLT	13	13	13
30	9213107	BOLT	6	6	6
31	1062197	PIN	2	2	2
32	1061097	LYNCH PIN	1	1	1
33	1061079	GREASE NIPPLE	2	2	2
34	1062285	BELT	4	5	5
35	1061077	SPLIT PIN	1	1	1
36	1061165	CLUTCH ELVE	1	1	1
37	1061171	FLAP	16	12	19
38	1061168	PIN	1	1	1
39	9313056	BOLT	2	2	2
40	9313066	BOLT	6	6	6
41	1061482	FLAP (50mm)	-	-	1
	1061170	FLAP (70mm)	-	1	-
	1061098	FLAP (130mm)	-	5	-
42	9213085	NUT	1	1	1
43	1061336	BEARING	2	2	2

# Spearhead RHD OPEN 230/250/280

ITEM NO.	PART NO.	DESCRIPTION.	QUANTITY.		
			230	250	280
44	1061687	BOLT	4	4	4
45	1061113	PULLEY 130/80-4	1	-	-
	1061479	PULLEY 130/80-5	-	1	1
46	1061484	PVC SHAFT GUARD	1	1	1
47	1061114	PULLEY 180/80-4	1	-	-
	1061414	PULLEY 180/80-5	-	1	1
48	1061531	BOLT	8	8	8
49	1061556	BOLT	1	-	-
	1061555	BOLT	-	1	1
50	1061142	FLANGE	1	1	1
51	9213206	BOLT	3	3	3
52	9213086	BOLT	2	2	2
53	1061268	PIVOT PIN	2	2	2
54	1061049	STRAIN PULLEY 130/4	1	-	-
	1061335	STRAIN PULLEY 130/5	-	1	1
55	1061539	BELT TENSIONER	1	1	1
56	9100106	WASHER	6	6	6
57	1061552	SHIELD CAP	1	1	1
58	1061551	PTO HOOK	1	1	1
59	1062286	HAMMER FLAIL	26	28	32
	1061034	Y-BLADE FLAIL (OPTION)	78	84	96
60	1061530	BOLT	26	28	32
61	1061490	CLUTCH ELVE	1	1	1
62	1061493	BUSHING	4	4	4
63	1061494	CIRCLIP	4	4	4
64	1061496	SLIDING TUBE	-	-	1
	1061495	SLIDING TUBE	1	1	-
65	1061571	BELT SHIELD - LH	1	1	1
66	1061501	SPACER (For use with Y-Blade Flails only)	52	56	64
67	1061507	SCRAPER – RHD OPEN 230	1	-	-
	1061508	SCRAPER – RHD OPEN 250	-	1	-
	1061509	SCRAPER – RHD OPEN 280	-	-	1
68	1061511	SKID (RIGHT)	1	1	1
69	1061510	SKID (LEFT)	1	1	1
70	1061512	FLAP BAR – RHD OPEN 230	1	-	-
	1061513	FLAP BAR – RHD OPEN 250	-	1	-
	1061514	FLAP BAR – RHD OPEN 280	-	-	1
71	1061523	HYDRAULIC CYLINDER	1	1	1
72	1061559	CLAMP	1	1	1
73	1062046	BELT SHIELD CAP	1	1	1
74	1061561	CAP	5	5	5
75	1061575	GEARBOX 312 950 - LH	1	1	-
	1061574	GEARBOX 312 1200 - LH	-	-	1
76	1062152	HANDLE	2	2	2
77	1062153	LINKAGE	1	1	1

# Spearhead RHD OPEN 230/250/280

ITEM NO.	PART NO.	DESCRIPTION.	QUANTITY.		
			230	250	280
78	1062118	GEARBOX PLATE - LH	1	1	1
79	1062236	SLIDING TUBE	1	1	-
	1062119	SLIDING TUBE	-	-	1
80	1062120	SLIDING TUBE	1	1	-
	1062121	SLIDING TUBE	-	-	1
81	1062240	FRAME – RHD OPEN 230	1	-	-
	1062241	FRAME – RHD OPEN 250	-	1	-
	1062242	FRAME – RHD OPEN 280	-	-	1
82	1062125	REAR GATE – RHD OPEN 230	1	-	-
	1062126	REAR GATE – RHD OPEN 250	-	1	-
	1062127	REAR GATE – RHD OPEN 280	-	-	1
83	1062239	BOLT	4	4	4
84	1062243	BOLT	1	-	-
85	1061622	BUSHING FOR STRAIN PULLEY	1	-	-
	1061565	BUSHING FOR STRAIN PULLEY	-	1	1
86	1062128	FAN	1	1	1
87	1062129	BOLT	3	3	3
88	1062130	RUBBER GUARD – RHD OPEN 230	1	-	-
	1062131	RUBBER GUARD – RHD OPEN 250	-	1	-
	1062132	RUBBER GUARD – RHD OPEN 280	-	-	1
89	1062133	BAR (RUBBER GUARD) – RHD OPEN 230	1	-	-
	1062134	BAR (RUBBER GUARD) – RHD OPEN 250	-	1	-
	1062135	BAR (RUBBER GUARD) – RHD OPEN 300	-	-	1
90	1062136	BUSHING (L)	2	2	2
91	1062137	BUSHING (R)	1	1	1
92	1062287	REAR ROLLER – RHD OPEN 230	1	-	-
	1062288	REAR ROLLER – RHD OPEN 250	-	1	-
	1062289	REAR ROLLER – RHD OPEN 280	-	-	1
93	1062290	REAR ROLLER BRACKET RH	1	1	1
94	1062291	REAR ROLLER BRACKET RH	1	1	1
95	9213086	BOLT	2	2	2
96	1062138	BEARING & CASING	2	2	2
97	1062173	NUT	26	28	32
98	1062174	FLANGE	1	1	1
99	1062175	EXTERNAL CIRCLIP	2	2	2
100	1062176	BEARING CASING (L)	1	1	1
101	1062177	BEARING CASING (R)	1	1	1
102	1062292	ROTOR SHAFT c/w BEARING – RHD OPEN 230	1	-	-
	1062293	ROTOR SHAFT c/w BEARING – RHD OPEN 250	-	1	-
	1062294	ROTOR SHAFT c/w BEARING – RHD OPEN 300	-	-	1
103	1062181	BEARING	2	2	2
104	1062182	INTERNAL CIRCLIP	1	1	1
105	1062183	OIL WASHER	1	1	1
106	1062184	WASHER	1	1	1
107	1062185	WASHER	1	1	1

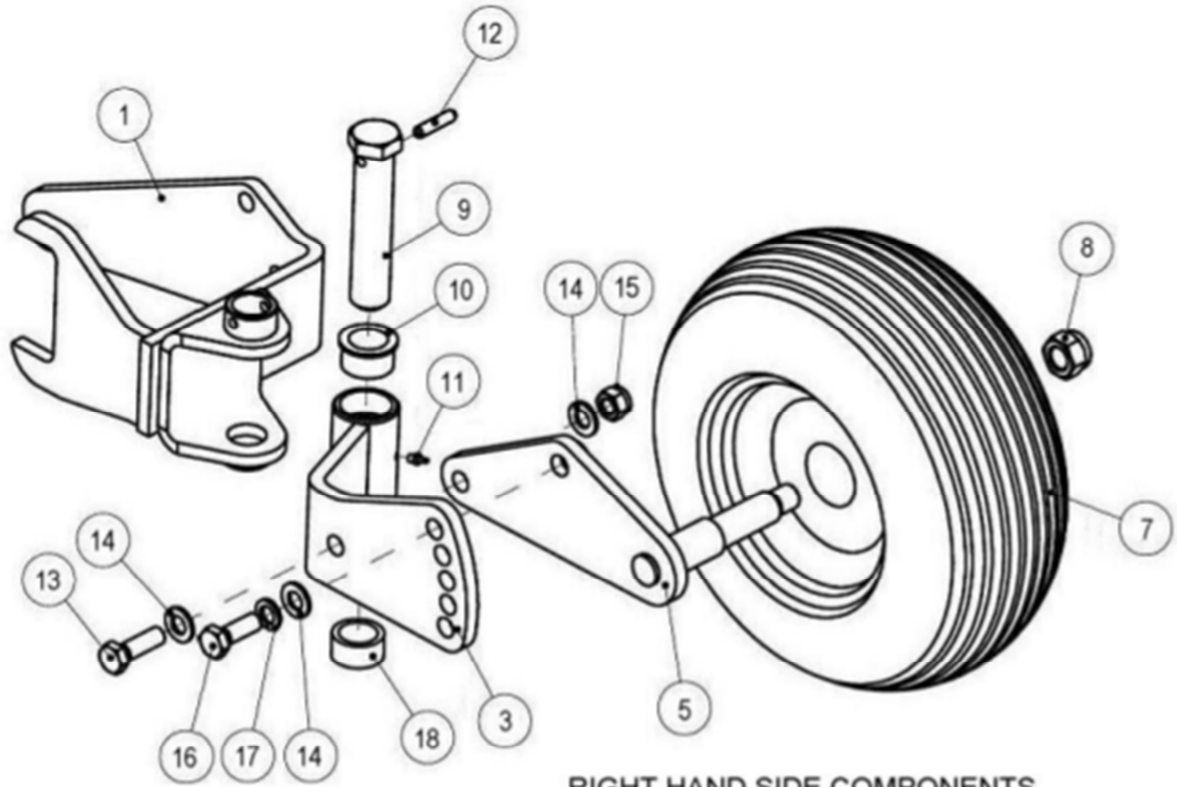
# Spearhead RHD OPEN 230/250/280

ITEM NO.	PART NO.	DESCRIPTION.	QUANTITY.		
			230	250	300
108	1062186	BEARING GUARD	2	2	2
*	1062234	HYDRAULIC OFFSETTING PIPES (2000)	1	1	1
*	1062235	HYDRAULIC OFFSETTING PIPES (2500)	1	1	1
*	1062246	PTO SHAFT	1	-	-
*	1061690	PTO SHAFT	-	1	1

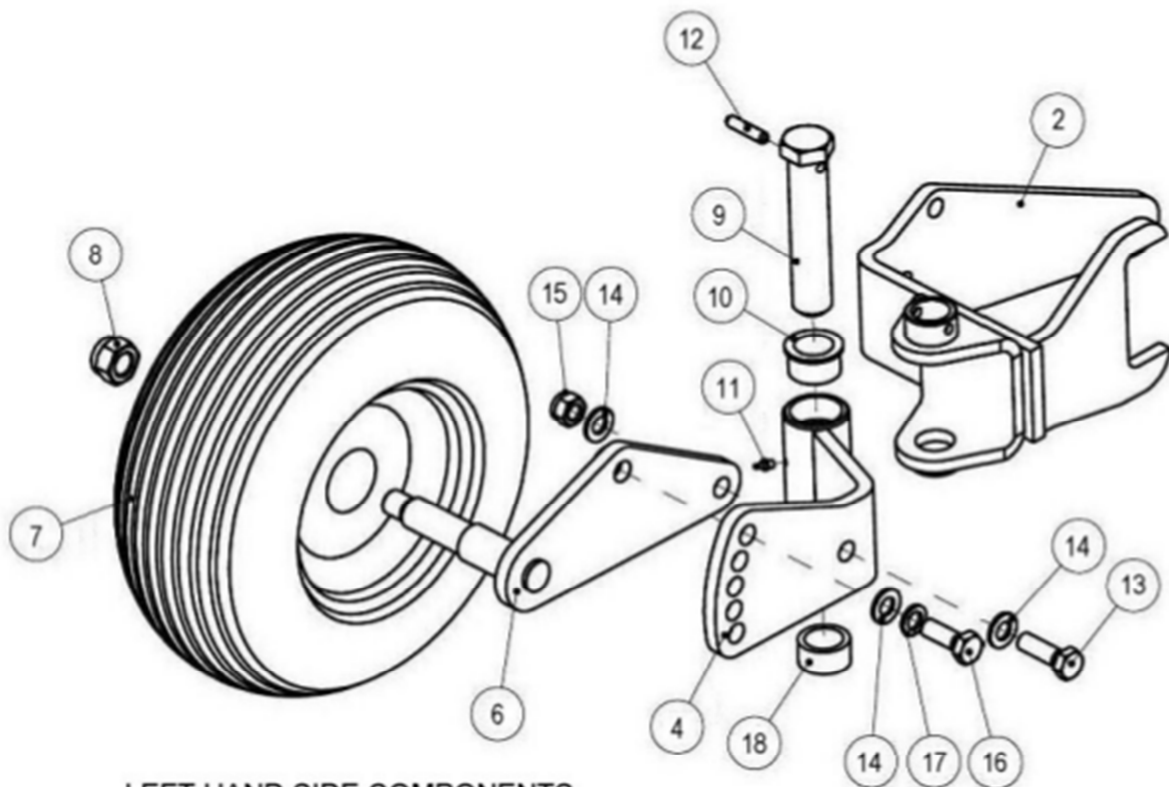
*\*Components not illustrated*

# Spearhead RHD OPEN 230/250/280

## Optional Equipment – Support Wheels



RIGHT HAND SIDE COMPONENTS



LEFT HAND SIDE COMPONENTS

# Spearhead RHD OPEN 230/250/280

ITEM NO.	PART NO.	DESCRIPTION.	QUANTITY.		
			230	250	280
1	1062147	BRACKET SUPPORT RH	1	1	1
2	1062148	BRACKET SUPPORT LH	1	1	1
3	1062143	WHEEL BRACKET RH	1	1	1
4	1062144	WHEEL BRACKET LH	1	1	1
5	1062145	WHEEL AXLE RH	1	1	1
6	1062146	WHEEL AXLE LH	1	1	1
7	1062139	WHEEL	2	2	2
8	9113008	NUT	2	2	2
9	1062141	PIN	2	2	2
10	1062142	BUSHING	2	2	2
11	1061554	GREASE NIPPLE	2	2	2
12	1062149	PIN	2	2	2
13	1062140	BOLT	2	2	2
14	05.281.14	WASHER	6	6	6
15	1062108	NUT	2	2	2
16	1061687	BOLT	2	2	2
17	05.282.08	WASHER	2	2	2
18	1061337	BUSHING	2	2	2





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