

SPEARHEAD

SNIPER 600 SHD FLAIL MOWERS



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HANDBOOK

Model type: Type modèle : <i>Entwerfen Sie Typ:</i>		SNIPER 600 SHD
Model number: Nombre modèle : <i>Entwerfen Sie Zahl:</i>		956225__
Serial numbers: Numéros de série : Seriennummern:	Machine: Machine: <i>Maschine:</i>	S_____
	Cutting implement: Instrument de coupe: <i>Schneidenwerkzeug</i>	S_____
	Other: Autre: <i>Anderer:</i>	
Name of owner: Le nom de propriétaire : <i>Name des Eigentümers:</i>		
Date of delivery / installation: La date de livraison/l'installation : <i>Datum der Lieferung / Installation:</i>		

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.

IMPORTANT

Au point de transfert de possession enregistrez les informations ci-dessus mentionnées. Noter le numéro de série de votre machine et mentionnez les dans toute communication avec nos services ou votre revendeur. (La plaque de numéro de série est localisée sur le central de machine). Ceci est important pour la commande de pièces détachées. Pensez à noter tous les numéros et toutes les lettres.

Les informations données dans ce manuel sont correctes cependant, du fait de développement constant des machines Spearhead. Changements dans les caractéristiques sont inévitables. Si vous trouvez que les informations données ne correspondent pas à votre machine veuillez contacter le service des réparations ou des informations plus récentes vous seront données.

Ce manuel peut montrer des caractéristiques optionnelles et ne peut pas être considéré comme spécification de la machine. Cette machine a été testée, et elle est considérée comme fiable à condition d'une bonne utilisation. Assurez-vous que votre opérateur est qualifié en ce qui concerne l'utilisation de la machine ainsi que son entretien.

WICHTIG

Am Punkt der Übertragung des Eigentumsrecht zeichnet die oberen Informationen auf. Merken Sie die Seriennummer von Ihrer Maschine ein und geben sie diese immer an, wenn sie sich an uns oder ihren Händler wenden. (Die Seriennummerplatte ist auf der Maschinenzentraleinheit befunden). Das ist besonders bei ersatzteilbestellungen wichtig. Vergessen sie nicht, alle Zahlen und Buchstaben zu notieren.

Die Angaben in diesem Handbuch sind bei Veröffentlichung korrekt. Aufgrund der konstanten Weiterentwicklung von Spearhead Maschinen sind jedoch Änderungen in der Spezifikation unvermeidlich. Wenn die Information in diesem Handbuch nicht mit Ihrer Maschine übereinstimmen, nehmen sie bitte Kontakt mit der Spearhead Kundendienstabteilung auf, die Ihnen gerne die aktuellen Informationen zukommen lässt.

Das Handbuch kann sowohl Beschreibungen für die Standardausführung als auch für Zubehör enthalten und ist nicht als Maschinenspezifikation zu verwenden. Die Maschine ist getestet und bei sachgemäßem Betrieb als sicher befunden worden. Sorgen sie dafür, dass ihr Bedienpersonal in Anwendung und Wartung richtig geschult wird.

**This machine is produced by ZANON S.R.L. on behalf of
Spearhead Machinery Limited.**

EC DECLARATION OF CONFORMITY

Conforming to EU Directive 2006/42/EC

We,

Of ZANON S.r.l., VIA Madonnetta, 30. 35011 Campodarsego (Padova) - Italy.

Declare with our exclusive responsibility that the interchangeable equipment to be coupled with an agricultural tractor called:

FLAIL MULCHER SERIES TS-TWIN

MODEL	SERIAL NO	YEAR
TS-TWIN 600		

To which this declaration refers, complies with the following legislative provisions and harmonised product standards:

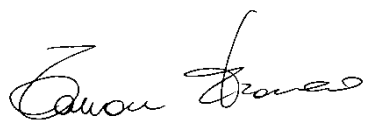
Directive 2006/42/EC (Machinery Safety)

In order to verify conformity, the following standardised technical specifications have been applied:

EN 349: 1993+A1:2008	EN 1037:1995+A1:2008	EN ISO 11202:2010	EN ISO 12100:2010
EN ISO 4254-12:2012	EN ISO 13849-1:2008	EN ISO 13857:2008	EN 15436-1:2008
EN ISO 13524:2009	CEN/TS 15436-3:2009	EN 15436-4:2009	
EN 15436-2:2008	EN ISO 3746:2010	EN ISO 4254-1:2013	

ZANON S.r.l.

Mr Franco Zanon

Signed 
On behalf of Zanon S.r.l.

Date: / /

Sniper 600 SHD Flail Mower

This manual includes instructions for installation, use and maintenance of the Sniper 600 SHD flail mower in the following sections.

The machine has been designed for use in the agricultural sector only, for shredding grass, the stalks of finished crops, brush, growth on fallow land etc. The machine is drawn by the tractor by means of a three-point hitch and works on the ground under its own weight and by virtue of rotating rotors that are driven by the tractor's power take-off by means of a PTO shaft connection. Any different use should be considered improper and therefore potentially dangerous to the safety of the operator and any exposed persons. This manual is integral to the Sniper flail mower, defines the purpose for which it was built and contains all the information required for proper and safe use. Regular machine operation depends on its correct use and adequate maintenance: it is advisable, therefore, to follow these instructions carefully to prevent any situation that could compromise the machine's operation and durability. It is also important to follow that which is described in this manual since Spearhead declines any liability resulting from negligence or from not observing these norms, since it would result in the warranty being annulled.

It is mandatory to verify upon delivery that the Sniper flail mower is integral and complete in all its parts. Any complaints must be presented in written within 8 (eight) days from receiving the machine. Spearhead can however be contacted at any time for immediate and precise technical assistance and anything required for optimum operation and maximum performance of the equipment. Upon receiving the product, carefully read the manual and carefully follow the instructions contained in it.

IMPORTANT

All technical material or description in this manual is exclusively owned by Spearhead who prohibits the complete or partial reproduction of the same unless written approval has been issued by the Spearhead.

Data, illustrations and descriptions in the manual cannot be considered binding. Spearhead reserves the right to make changes at any time that it considers to be suitable for improvement or for a constructive or commercial requirement.

This manual reflects the state of techniques at the time of marketing the flail mower and cannot be considered inadequate if updated at a later date due to modifications of related legal provisions.

Spearhead declines any and all liability for damages caused by the flail mower to persons, animals or property, resulting from use other than that described in this manual, or due to damage caused by negligence or by not observing the instructions contained in this manual.

The manual should be carefully stored in a suitable area to guarantee its physical integrity; it should be easy to access by anyone authorised to consult it. The manual is an important document that should accompany the flail mower and all users should be held responsible for safeguarding it.

For additional information or clarifications regarding anything contained in this manual, or if the manual deteriorates, is destroyed or lost, using the flail mower is prohibited and it is mandatory to request a new manual as soon as possible exclusively through:

Spearhead Machinery Limited

Green View, Salford Priors,
Evesham, Worcestershire, WR11 8SW

Direct download via Spearhead's online PDF manual library

<http://dealerinside.spearheadmachinery.com/dealerinside/manuallibrary/default.aspx>

For technical enquiries email: service@spearheadmachinery.com or call +44 (0)1789 491867

For parts enquiries email: parts@spearheadmachinery.com or call +44 (0)1789 491862

The following manual is an integral part of the product and must be stored carefully, in order that it keeps its integrity and can be consulted repeatedly throughout the entire life of the flail mower.

The flail mower is manufactured to conform to the provisions contained in Directive 2006/42/EC. It is therefore equipped with EC marking and accompanied by the following EC conformity declaration.

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1 Machine Description

1.1 Intended Usage

1.1.1 Allowed Uses

The machine has been designed for use in the agricultural sector only, for shredding grass, the stalks of finished crops, brush, growth on fallow land etc.

When the flail mower works it guarantees the required level of safety even in the presence of an insignificant malfunction of its components or hazardous operating conditions, however, always within the permitted uses.

With reference to the above, the following are considered allowed uses:

- Using the flail mower to mow crop residue.

The flail mower must not be used for purposes other than those described in this manual.

1.1.2 Improper Uses

The machine manufactured has been designed for use in the agricultural field by trained personnel and is intended for the following operations only: shredding maize stalks, straw, chard and soy leaves, brush, grass and non-woody stalked plants in general provided they are found on level, non-stony ground and are evenly distributed.



DANGER! Under no circumstances should the machine be used for any purpose other than the permitted uses (given above) or in any field other than the agricultural field. More specifically, it must not be used for: Shredding woody stalked plants, grinding wood, or for similar applications on hard materials, or working with tools in contact with the ground. Do not use the machine on stony ground as this would mean the tools would come into contact with stones, with the extremely hazardous result of stones being flung off at great speed. In addition, the tools would fail mechanically straight away, with just as serious consequences. Failure to comply with the instructions given shall result in serious safety hazards. If in any doubt, contact the manufacturer.

Remember that the rear doors should only be opened for maintenance purposes, for instance to remove clogging, replace broken or missing tools, remove foreign matter, etc. Before opening the doors, make sure you have disengaged the tractor's PTO and that the rotors have come to a halt (bear in mind that inertia can mean the rotor takes even a few minutes to stop once the power take-off has been disengaged). Also make sure nobody is anywhere near the machine. Once the rear hoods have been opened, switch off the tractor and remove the keys (and keep them in a safe place) before going near the rear of the machine or allowing other people to come near.



WARNING! Failure to follow these rules may expose people to the danger of serious harm or even death. The hydraulic operation of the rear door can cut off people's limbs if they are allowed near.

While working, the parking stands must not interfere with the machine's proper operation: they must be turned upside down and fastened in their relevant mounts. When work is finished, the parking stands must be returned to their original position, resting on the ground. The PTO must be run at the required speed (540 rpm).



DANGER! Do not make sharp turns while the machine is working, making sure you always lift it when changing direction and reversing. Do not lift the machine more than 40 cm off the ground, see Figure 1.2.



Figure 1.1 Spearhead Sniper 600 SHD

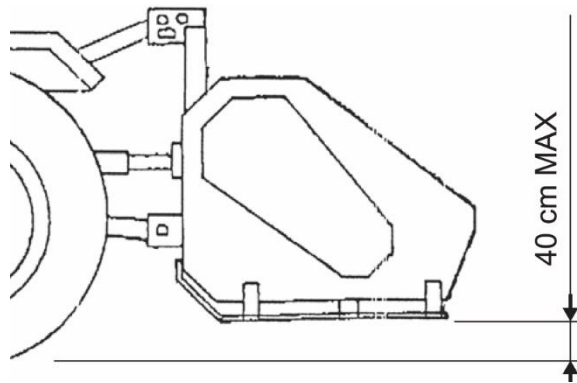


Figure 1.2

1.2 General Arrangement

With reference to Figure 1.3, The Sniper flail mower is a piece of farming equipment comprising a hard-wearing sheet metal structure with tubular bracing to give it lasting dimensional stability.

The structure supports the A-frame for connecting the machine to the tractor and the drive assembly that incorporates a gearbox and two belt drives to transfer power from the tractor's power take-off to the rotors.

The flail mower consists of the following parts:

POSITION	DESCRIPTION
1	Frame with three-point hitch
2	Three-point hitch top linkage
3	Three-point hitch lower linkage
4	Protective hood
5	Drive shafts
6	PTO guard
7	Gearbox
8	Rotor shaft
9	Flail
10	Rear roller
11	Skid
12	Machine stand
13	PTO shaft guard
14	PTO shaft coupling
15	Front safety flap
16	Hydraulic lift rams
17	Light bar for road use (optional extra)

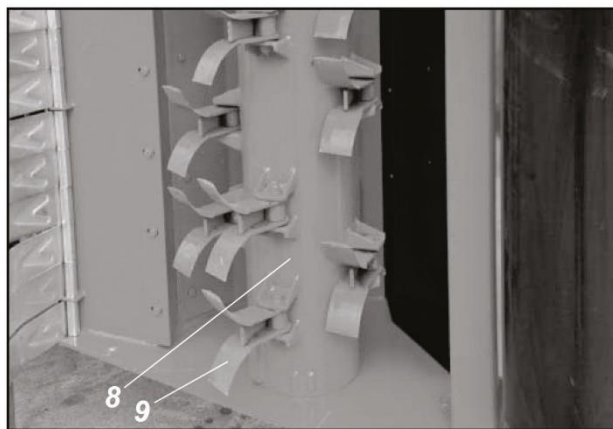
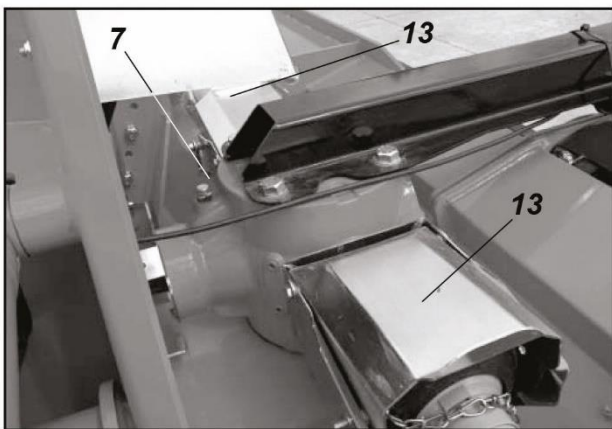
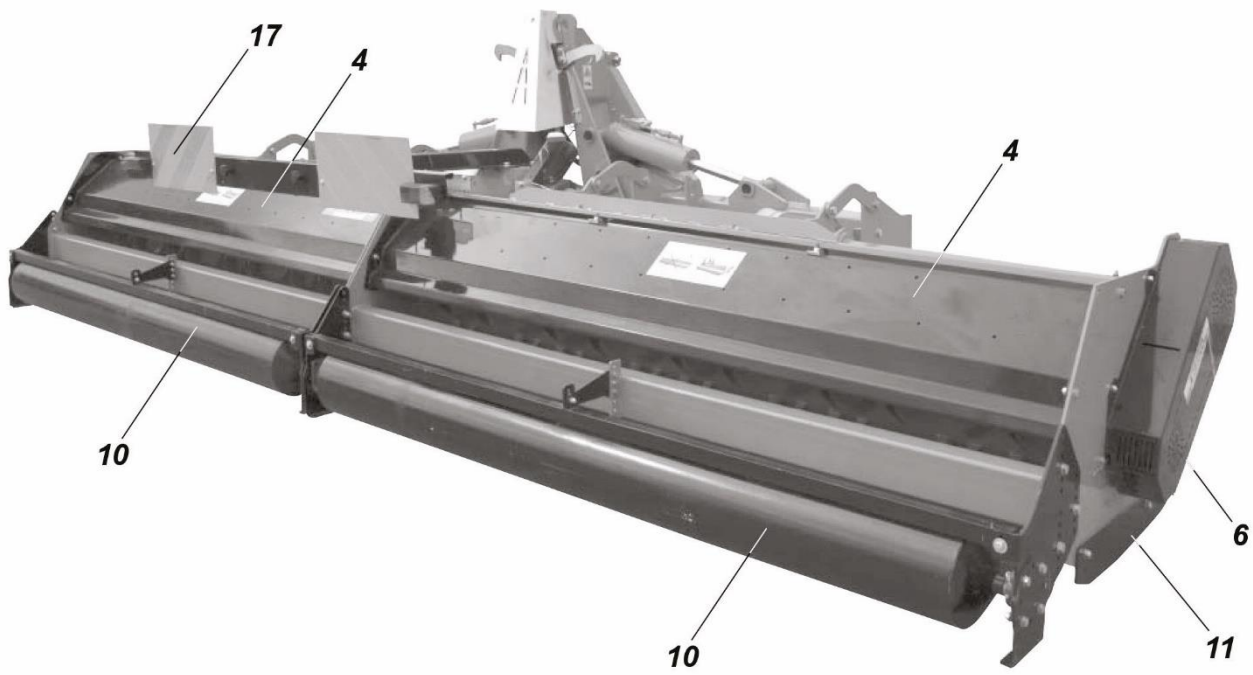
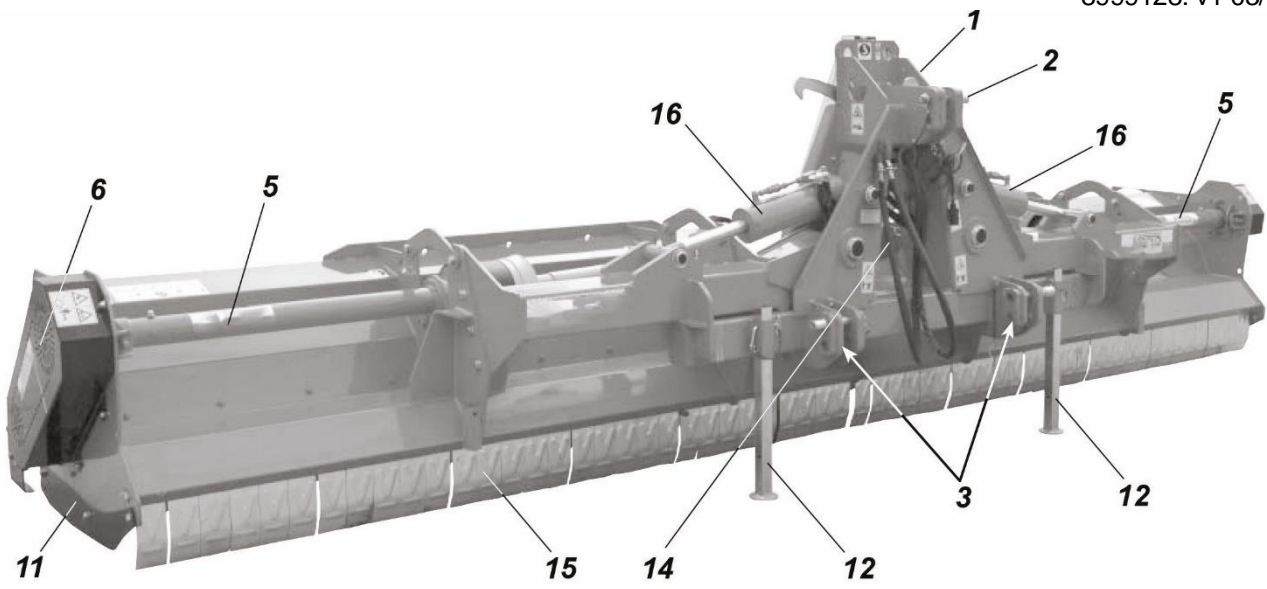


Figure 1.3

1.3 Identification

Each flail mower is equipped with a serial plate; see Figure 1.4 that includes the following data in this order:

- EC Marking.
- Manufacturer marking.
- Name and address of the manufacturer.
- Machine Whole Goods Code (WGC).
- Machine Product Group Code.
- Serial number of the machine.
- Year of construction.
- Mass in kg.
- Model year.

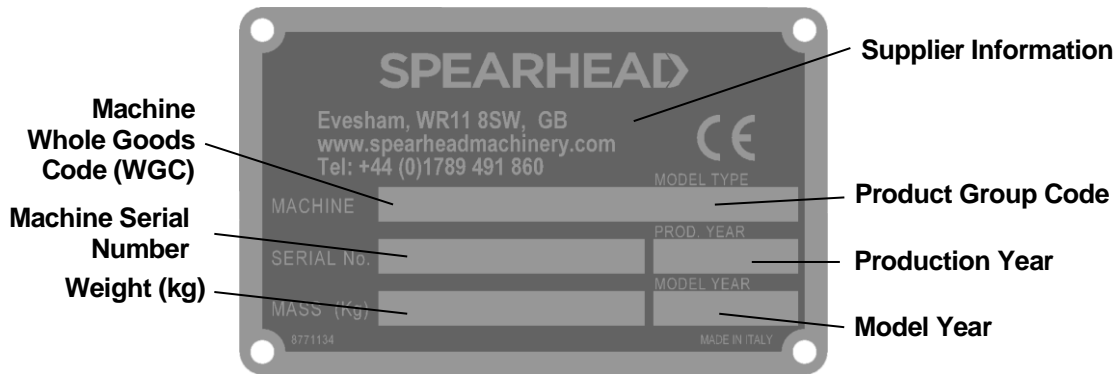


Figure 1.4

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

This data can identify the flail mower and its characteristics, 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 flail mower is dismantled, it should be destroyed to prevent any form of abuse.

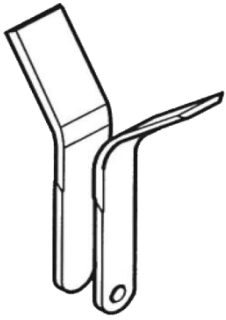
1.4 Machine general specification

Sniper Series (1)	600 SHD
Working Width	6000mm
HP Power Requirement	150-320
Weight	2870kg
Width	6300
Length	1600
Height	1060
Hitch To Tractor	3-point Universal
PTO Speed	540 rpm
Primary Transmission	PTO Input Shaft
Secondary Transmission	Belts
Cut Height Adjustment	Mechanical

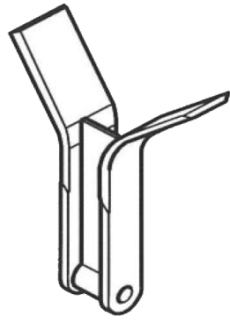
Notes:

- (1) Spearhead constantly reviews and improves product designs and reserve the right to change this information. Actual machines may vary from the above specification. Contact your Spearhead Sales representative if you have any queries.

1.4.1 Flail options



Single
x144



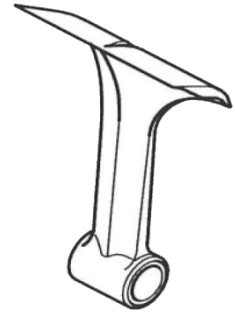
Double with blade
x72+144



Double with spacer
x72+144



Cupped knife
x76



Hammer
x76

1.5 Sound Level

The sound level emitted by the machine has been measured on a similar model with the equipment working under no-load conditions.

Sound **pressure** level at driver's seat with **cab-less** tractor: **L_{WA} = 90 dB (A)**

Sound **power** level at driver's seat with **cab-less** tractor: **L_{pA} = 95 dB (A)**

Sound **pressure** level at driver's seat with **cab** tractor: **L_{WA} = 70 dB (A)**

Sound **power** level at driver's seat with **cab** tractor: **L_{pA} = 75 dB (A)**

2 Safety

2.1 Level of danger

The safety of the operator and exposed persons is the main concern of the designer and the manufacturer of the machine. When designing a new machine, one tries to plan for all possible danger situations and risks connected to using the machine, adopting the steps necessary to make the equipment as safe as possible. The number of accidents remains very high however, especially due to incautious and awkward use of the machine. It is therefore recommended to carefully read this manual and this section in particular, regarding safety standards, avoiding behaviour that is inappropriate or in contrast with the instructions contained in this manual.

Pay attention to the following danger signal where contained in this manual and follow safety instructions.



DANGER!

Level 1 - This signal warns that if the described operations are not carried out properly, they will cause serious injury, death or long-term health risks.



WARNING!

Level 2 - This signal warns that if the described operations are not carried out properly, they may cause serious injury, death or long-term health risks.



CAUTION!

Level 3 - This signal warns that if the described operations are not carried out properly, they may cause damage to the machine.

2.2 Terminology

The indicated levels of danger refer to specific risk situation that may occur during machine use and may involve the same machine, the operator and any exposed persons. With the purpose of highlighting situations or operations that may result in risks, the meanings of terms used in this manual are indicated here:

- **HAZARDOUS AREA:** Any area in and/or around a machine where the presence of an exposed person constitutes a risk to the health and safety of said person
- **EXPOSED PERSON:** A person fully or partly in a hazardous area
- **OPERATOR:** The person or personnel in charge of the installation, the operation, the adjusting, the cleaning, the repairing and the moving of the machine.
- **SPECIALISED PERSONNEL:** any person specifically trained and approved to carry out maintenance or repair interventions that require particular knowledge of the machine, its operation, the installed safety devices, intervention modes. It must be capable of recognising danger present on the actual machine, therefore avoiding at risk situations.
- **RISK:** a combination of the probability and seriousness of injury or damage to health which can arise in a dangerous situation.
- **GUARD:** a part of the machine that is used to specifically guarantee protection by way of a material barrier.
- **PROTECTION DEVICE:** a device that reduces risk (unlike the guard) either on its own or together with the guard.
- **INTENDED USE:** the use of the machine in accordance with the information provided in the operating instructions.
- **REASONABLE FORESEEABLE MISUSE:** the use of the machine different to the information provided in the operator's instructions, which may be the result of readily predictable human behaviour.
- **AUTHORISED ASSISTANCE CENTRE:** The Authorised Assistance Centre, legally authorised by the Manufacturer, is formed by specialised staff able to carry out all types of assistance, maintenance and repair work, even of a certain complexity, required to maintain the machine in perfect working order.



WARNING! Carefully read the following rules. If the instructions described are not followed, a situation may arise which causes irreparable damage to the machine or property, or injury - even severe - to people or animals. Spearhead declines all responsibility for damage caused by not complying with the safety and injury prevention regulations described below. Spearhead also declines any responsibility for damage caused by improper use of the machine and/or as a result of modifications made without authorisation by the manufacturer.

2.3 Safety Decals

The flail mower is equipped with safety decals warning about residual risks present on the machine that were not possible to eliminate. Figure 2.1 specifies the meaning of symbols contained in the decals. The operator must memorise the meaning of these decals. The labels should always be kept clean and replaced immediately if they are fully or partially detached or damaged.



Figure 2.1

Figure 2.2 shows an indication of the precise points on the machine where the safety decals and serial plate are usually applied by the manufacturer.

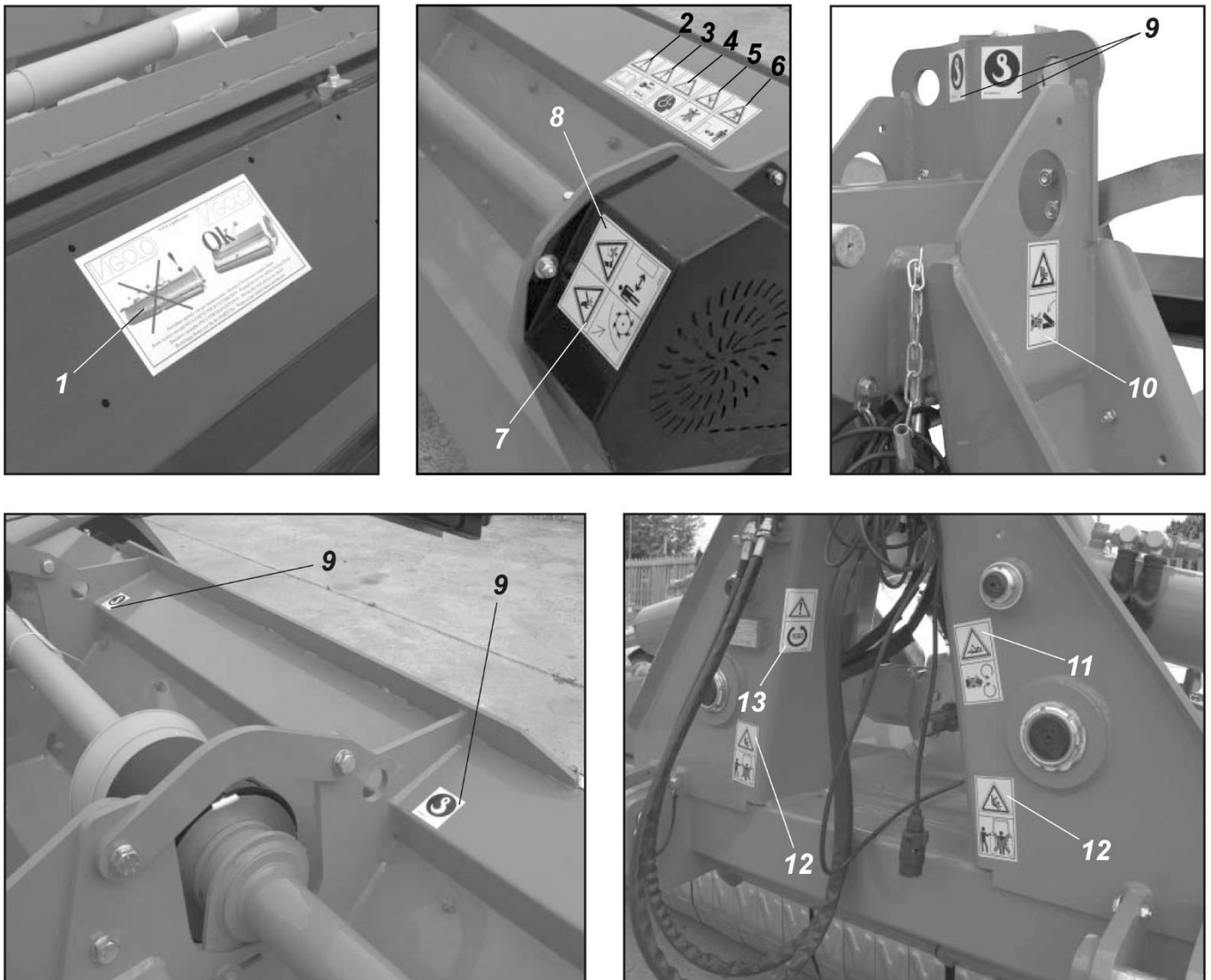


Figure 2.2

2.4 Personal Protective Equipment

In general it is necessary to wear suitable clothing for the work to be carried out. In particular, as far as flail mowing use, obey the following provisions:

- **It is mandatory** to use clothing which is as suitable as possible, meaning not too loose and without any protruding or moving parts (for example ties or necklaces). Do not wear belts, rings and chains. Always use sturdy safety footwear. Long hair must be tied using a specific cap.
- **It is mandatory** to use protective goggles or a mask before proceeding with the work in order to protect the face and eyes from vegetable fragments which may be projected outwards during flail mowing.
- **It is mandatory** to use protective muffs in order to safeguard hearing from noise from the equipment during work.

2.5 Ecology and pollution



DANGER! Comply with laws in force in the country the machine is being used in regarding use and disposal of products employed in cleaning and servicing the machine, and comply with the instructions issued by the manufacturer of said products and featured in the warnings on the relevant packaging. Keep products used for cleaning and maintenance out of reach of children.

2.5.1 Disposal

When the time comes to scrap the machine, it must be disposed of through a suitable rubbish tip, in compliance with current legislation. Before scrapping, sort the machine's components into plastic or rubber parts, electrical and electronic material.

Parts made entirely from plastic, aluminium or steel can be recycled when collected by special recycling centres. Collect up waste oil and dispose of it through relevant collection centres.



DANGER! Waste oil qualifies as hazardous waste according to current law and, as such, must not be released into the environment; it should be recovered and disposed of through suitable collection centres.

You must contact the relevant environment agency in your country for the collection of waste oil.

2.5.2 Preparation for storage

If the machine is due to be left unused for a long period, it should be stored in a place where it will not be exposed to the elements and should be protected to avoid deterioration.

Before storing, we recommend cleaning the whole machine thoroughly and suitably lubricating all mechanical parts to protect them from rust.

Make sure storage temperature is in the range 0°C to 50°C.

Before mothballing the machine, it is advisable to proceed as follows:

- 2.5.2.1. Clear any shredding debris off the rotors and flails;
- 2.5.2.2. Clean the machine thoroughly;
- 2.5.2.3. Perform a general inspection, looking out for possible damage to the structure and areas where paintwork has been scraped off or worn away; make sure the original safety decals are attached in their relevant positions and are intact and legible;
- 2.5.2.4. Securely tighten all screws and bolts, especially those fastening the flails; see Section 6.0.
- 2.5.2.5. Thoroughly grease any parts that usually require this kind of attention, see Section 7.3; smear all non-painted parts with lubricant; lastly, protect all equipment with a plastic tarpaulin, while making sure there is sufficient ventilation. Once you have finished this treatment, store the equipment in a dry place;
- 2.5.2.6. Where possible, store the machine indoors or under shelter, on a level, stable surface.
- 2.5.2.7. When carried out with due care, this procedure will ensure the equipment is in full working order and in a perfect state of repair when the time comes to put it back into operation.

2.5.3 Removing the machine from packing or longer term storage

Before using the machine for the first time, or when it has not been used for long periods, proceed as follows:

- 2.5.3.1. Make sure the machine has not been damaged;
- 2.5.3.2. Make sure mechanical parts are in a good state of repair and not rusted;
- 2.5.3.3. Check the flails for wear;
- 2.5.3.4. Thoroughly grease all moving parts; see Section 7.3;
- 2.5.3.5. Make sure there is no oil leaking from fittings or hoses;
- 2.5.3.6. Make sure all guards are correctly fitted.

2.6 Safe use



DANGER! Using the machine correctly, following the rules listed below to the letter and strictly applying all precautions to avoid hazardous situations will avoid the danger of accidents or injury, helping the machine to work better, last longer and suffer minimal breakdowns.

Spearhead Machinery disclaims any objective or subjective liability in the event of any failure to apply and comply with the rules of conduct given herein.

- The machine is not suitable for use in any field other than the agricultural sector.
- The machine must be used by a single operator driving the tractor.
- Any use other than for the specified purpose is seen as misuse.
- Only authorized, suitably trained personnel issued with appropriate instructions must be allowed to use the machine.
- In addition to reading and understanding the contents of this manual, the appointed operator must be sufficiently trained in the correct use of the machine and must have a driver's licence. Operators are advised to contact the manufacturer if in any doubt as to how to use the machine and what the instructions herein mean.
- The manual must be kept handy at all times so that it can be consulted when necessary. If it is misplaced or damaged, you must order a replacement copy from Spearhead Machinery.

- The operator must make sure no person or animal comes within range of the machine while it is operating. Never operate the machine near people standing or passing within range of the machine.
- Do not use the machine if you are tired, sick or under the influence of alcohol, medicine or drugs.
- This machine is designed to be used during the day normally; if, in exceptional cases, you need to use it at night or when visibility is poor, you must use the lighting system supplied with the tractor, or an auxiliary lighting system, where necessary.
- Any arbitrary change made to this machine shall relieve Spearhead Machinery of any liability for damage or injury to operators, third parties or property.
- Check the machine carefully each time before putting it into operation. Spearhead Machinery cannot provide for every possible foreseeable misuse that might result in a potential danger.
- The decals attached to the machine, see Section 2.3 give a series of important instructions: you are advised to observe them for your own safety.
- Make sure all safety decals are legible. Clean them and, where necessary, replace them with new labels; see Figure 2.2.
- Before using the machine, make sure all safety devices are fitted in their proper positions and are in a good state of repair; if any guards are not working or damaged, replace them immediately.
- Before getting out of the tractor and before performing any maintenance work, apply the parking brake, switch off the engine, remove the key from the ignition and keep it in a safe place.
- Personnel are required to use safety gear and personal protective equipment while using and servicing the vehicle; see Section 2.3 and Section 2.4.
- The machine operator is strongly advised not to wear any item of clothing that could get caught in machinery.
- Operating the machine may result in dust being generated when working with dry products (hay, straw, etc.). You are advised to check the filters on the cab ventilation system at regular intervals, or to use suitable respiratory system protection, such as dust masks.
- During use, the operator must have a sufficiently good view of work areas classed as danger zones; consequently, you must keep the tractor's mirrors clean and in an optimum state of repair.
- The machine must not be left unattended while the tractor is running.
- Keep the machine clean of foreign matter (debris, tools, other foreign objects), which could interfere with its operation and injure the operator.
- Do not work on muddy, sandy or loose soil.
- Check hydraulic hoses for wear. If they have deteriorated (or at least every 5 years), have them replaced.
- Do not use controls or hoses as something to hang on to: these parts move and do not provide a stable handhold.
- Any changes to the machine could pose a safety hazard. In this case, the user alone will be liable for ensuing accidents.
- Removing or tampering with safety devices is strictly prohibited.
- Make sure the safety decals are in good condition. If the decals have deteriorated, they must be replaced with other originals to be ordered from the manufacturer and attached in the position illustrated; see Figure 2.2.
- Be aware of the risk of the machine accidentally touching high voltage overhead lines.
- Never use the machine to carry or lift people, animals or objects.

2.7 Firefighting measures

- It is advisable to ensure that personnel given the task of operating the tractor are familiar with the main courses of action to be taken in the event of fire.
- All fuels and most lubricants and hydraulic fluids are flammable.
- Do not smoke while refuelling or topping up fluid levels; do not refuel near naked flames; do not siphon off fuel.
- Switch off the tractor's engine before refuelling; do not refuel indoors.
- Before starting the tractor's engine, make sure there are no fuel/ lubricant/fluid leaks or spills that could result in small fires.
- Do not store flammable substances in places that are not suitable for the purpose; do not pierce or burn pressurized containers or spray cans; do not leave materials soaked in flammable substances lying around in piles.
- Be careful where you place rags or material that contains flammable residues.
- To minimize the risk of combustion, clean the machine at regular intervals with suitable equipment (water blaster or compressed air).
- Use appropriate extinguishing means: carbon dioxide, foam, dry chemical.
- Do not use water jets. Only use water jets to cool surfaces exposed to fire.
- Never use petrol, solvents or other flammable or toxic fluids to clean mechanical parts: use approved commercial solvents, which must be non-flammable and non-toxic.
- Do not perform welding near tanks, pipes, jerry-cans, electrical cables or flammable material in general.
- When performing welding work, use suitable shielding to protect flammable parts.

3 Machine Transportation

3.1 Lifting

The vehicle used to transport the machine must be sufficiently powerful, of an appropriate size and suitably prepared for the purpose.

Before transporting the machine, see Section 1.4 giving the weights and dimensions of the machine. Transportation should be carried out by qualified haulage contractors who guarantee correct handling of the material being carried.

The Manufacturer accepts no liability for transportation arranged by the Customer or by haulage contractors appointed by the latter. The machine must be loaded, taking care to avoid damage to the same by any other loads.

Before using, check that the available means are intact and suitable. Select ropes and/or chains of suitable lifting power, attaching them only to the lifting points designed for that purpose and marked with the relative symbol; see Figure 2.2 and Figure 3.1.



- Ensure that a crane of suitable lifting power for the machine is available.
- Before proceeding with lifting operations, make sure that any mobile machine elements have been secured properly.
- Lift the machine with extreme caution and transfer it slowly, without any abrupt movements.
- Lifting and transportation operations may be extremely dangerous unless carried out with the utmost caution.
- Personnel assigned to work should be specialised and fitted out with the relative Individual Protective Devices.
- Unauthorised personnel should be kept at a safe distance.
- Clean, clear and mark out the area of transfer.
- Do not touch suspended loads and remain at a safe distance.
- During handling, loads should not be lifted more than 20 cm from the ground.
- Ensure that the danger area in which the machine is being handled is free from obstacles and that there is a wide safe area to the side for the transit of persons.
- Under no circumstances should persons pass below suspended loads.
- The surface on which the machine is placed should be level in order to avoid possible shifting of the load.
- When the machine is placed on a means of transport it should be firmly secured to the surface on which it is resting by means of ropes or chains suitable for the weights to be anchored; see Section 1.4.
- For travel with the tractor, see the warnings given in the Section 3.2 below.

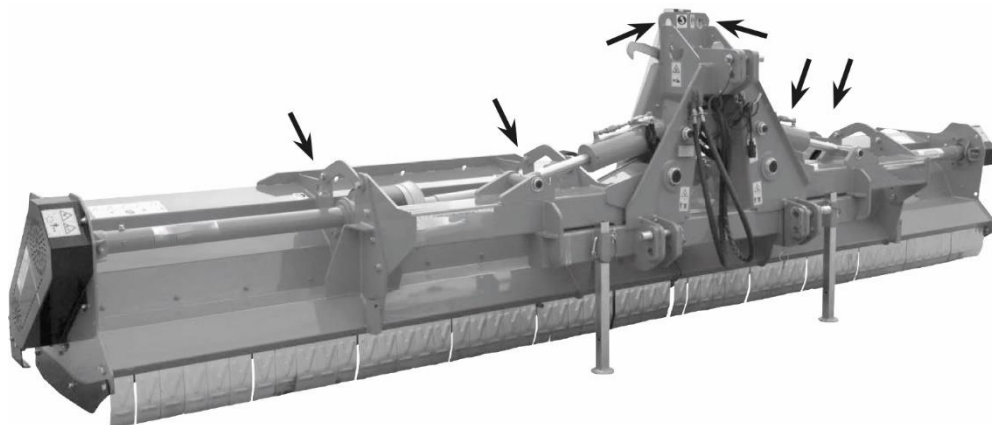


Figure 3.1

3.2 Travelling on public roads



CAUTION! When needing to travel on public roads, you must comply strictly with the local Highway Code, making extra sure you keep your speed to an appropriate level.

Before driving on roads, the relevant lights bar (optional extra) must be installed. You must fit the tractor with a flashing yellow or orange light. Before driving onto a public road from an unsealed or unclean area, you must clean the tractor's tyres of any mud still on them.

When travelling on public roads, the machine must be kept in the transport position, see Figure 3.2 and the tractor's PTO must be disengaged.



DANGER! Visually inspect the two couplers, see Figure 3.2 (1) to ensure they are positioned correctly. Under no circumstances should the PTO be engaged while the machine is in the folded position to prevent inevitable damage to the driveline.

Check that the rear lights units are working correctly as the machine covers the tractor's rear lights units when in the folded position. If the tractor's number plate cannot be seen properly, fit an additional duplicate number plate on the relevant plaque, also located on the lights bar, see Figure 3.2 (2).

The weight of the machine alters the stability of the tractor machine unit, affecting steering and braking capacity, and you should reduce speed accordingly. More specifically, bear in mind that at least 20% of the tractor-machine unit's total weight must be across the front axle at all times.

Check the tractor's lifting capacity and stability with the following formula and, where necessary, apply counterweights on the front, see Figure 3.3.



Figure 3.2

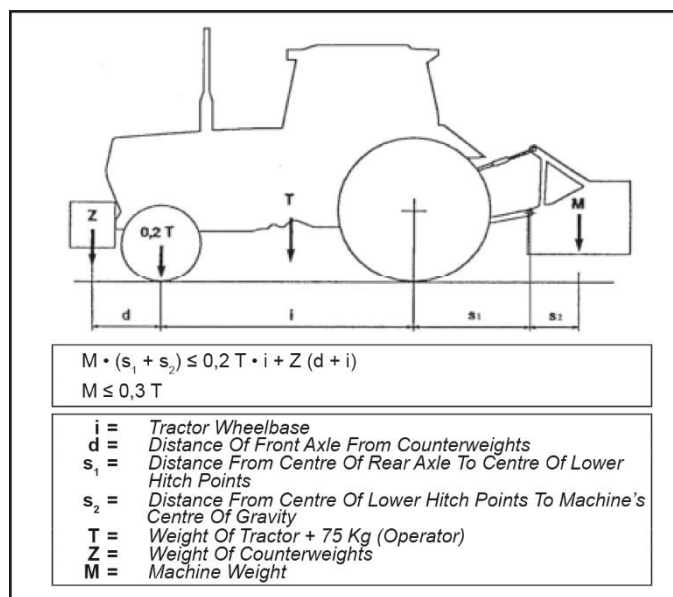


Figure 3.3

4 Setting up the machine



DANGER! Make sure that all machine parts are working properly during operation. Remember that most problems and breakdowns that may be encountered while using the machine are caused by fastenings coming loose.

Since all the mechanical parts and hydraulic connections tend to settle early on in the machine's service life, the machine must be checked very thoroughly.

Before using the machine, make sure there are no people or animals within its range.

Removing and/or altering guards on the machine are strictly prohibited. Do not use the implement if you are sick, tired or under the influence of medicine, drugs or alcohol.

Before using the machine, you must gain learn the layout of the controls and how they work.

It is good practice to inspect the area to be shredded before you start to make sure there are no dangerous obstacles such as stones, manholes, or other objects of any kind in the way, especially near a roadway.

4.1 Before setting up the machine

The machine does not have any controls of its own; instead all functions are controlled by the operator using devices on the actual tractor.

4.1.1 PTO shaft operation

The machine runs off power transferred by the tractor's PTO by means of the PTO shaft.

Check the tractor's user guide for the best way to operate the PTO.

4.1.2 Hydraulic hoses – for machine folding

The hydraulic hoses for the hydraulic rams which fold the machine between work and transport positions must be connected to one of the double-acting control valves on the tractor.

For information on connection procedures and system features on the tractor, refer to the relevant user guide. The first few times, it is best to proceed with caution until you become familiar with the controls. It is also a good idea to place labels on the tractor's controls so that you do not get them muddled up.

4.1.3 Hydraulic hoses – for opening rear doors (if fitted)

If the machine has hydraulically opening rear doors (optional), the hoses must be connected to one of the double-acting control valves on the tractor. For information on connection procedures and system features on the tractor, refer to the relevant user guide. The first few times, it is best to proceed with caution until you become familiar with the controls.

It is also a good idea to place labels on the tractor's controls so that you do not get them muddled up.

Remember that the rear doors should only be opened for maintenance purposes, for instance to remove clogging, replace broken or missing flails, remove foreign matter, etc.

Before opening the doors, make sure you have disengaged the tractor's PTO and that the rotors have come to a halt (bear in mind that inertia can mean rotors take even a few minutes to stop once the PTO has been disengaged). Also make sure nobody is anywhere near the machine.

Once the rear hoods have been opened, switch off the tractor and remove the keys (and keep them in a safe place) before going near the rear of the machine or allowing other people to come near.



WARNING! Failure to follow these rules may expose people to the danger of serious harm or even death. The hydraulic operation of the rear door can cut off people's limbs if they are allowed near.

4.2 Line of sight

Work areas can be checked using the tractor's rear-view mirrors or viewed directly by the operator.

When reversing, blind spots can be created that cannot be seen in rear-view mirrors, consequently you are advised to drive very slowly and keep a visual check on the area.

5 Use of the machine



WARNING! Before using the machine, gain familiarity with the controls and how they work.

Keep all parts of your body inside the tractor cab at all times to minimize the chance of being exposed to possible hazards outside the cab.

Before getting out of the tractor and before performing any maintenance or adjustment work, apply the parking brake, switch off the engine, remove the key from the ignition and wait for all moving parts to come to a complete stop.

Your safety and that of anyone nearby depends on your common sense and careful operation of the machine.

Consequently, you must be familiar with the position and function of all controls.

The machine must be kept in perfect working order at all times and must be repaired using original spare parts only.

5.1 Connecting the machine to the tractor

The machine must be connected to the tractor via a PTO running at 540 rpm of a suitable weight and power, in compliance with current code in the country where it is used.

The machine must fall within the weight, size and power ranges given in the tractor's user guide.



WARNING! You must wear suitable Personal Protective Equipment (PPE) when using, adjusting, servicing, repairing or handling the machine; see Section 2.4.

Connect the machine as follows:

- 5.1.1. Back the tractor up so that its rear lift arms are offered up to the machine's couplers, see Figure 5.1 (1 and 2).
- 5.1.2. Apply the tractor's parking brake, switch off the engine, remove the ignition key and get out.
- 5.1.3. Insert the hitch pins and relevant safety cotter pins.
- 5.1.4. Connect the machine's adjustable top link, see Figure 5.1 (3), to the tractor, lift the machine until the machine and tractor power take-offs are at the same height and adjust the adjustable top link so that the machine sits horizontally; see Figure 1.2.
- 5.1.5. Lock the tractor's lift arms to stop the machine rocking from side to side and thus compromising the tractor-machine unit's transverse stability.
- 5.1.6. Adjust the lift travel stops so that the machine cannot be lifted more than 40 cm off the ground during travel, see Figure 1.2.



DANGER! Carefully read the PTO shaft's operating and maintenance manual (attached to the shaft). The PTO shaft is an important power transmission device that has been factory balanced, since it rotates at a relatively high speed, and must not be altered in any way. When the PTO shaft is pulled out as far as it will go, regardless of working conditions, the telescopic tubes must still overlap by at least a third of their length. When the shaft's telescopic tube is pushed in as far as it will go, there should still be roughly at least 4 cm of play. If this is not possible, seek help from the manufacturer's technical department. With the machine fully lifted, make sure the telescopic tubes cannot slip out. Before starting work, make sure: the PTO shaft's guards are fitted with the relevant safety chains to stop them rotating and that everything is in an excellent state of repair.

Fit the PTO shaft on the splined shaft belonging to the machine's gearbox, holding down the safety pin; release the safety pin and pull the PTO shaft back out until the pin clicks audibly into the relevant slot. If you don't hear the pin click into place, repeat the procedure.

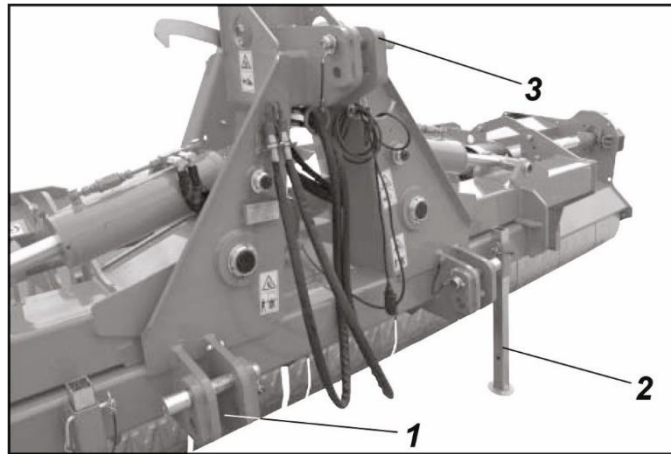


Figure 5.1

Do not use a PTO shaft without suitable guards meeting legal requirements. Fit the PTO shaft on the splined shaft belonging to the tractor's power take-off, holding down the safety pin; release the safety pin and pull the PTO shaft back out until the pin clicks audibly into the relevant slot. If you don't hear the pin click into place, repeat the procedure.



DANGER! Under no circumstances should you straddle the PTO shaft, whether it is rotating or not.

If the machine is being connected to the tractor for the first time, make sure:

- When steering is turned all the way, the shaft is not folded all the way back against the tractor, to avoid damaging the gearbox. In the event the PTO shaft turns out to be too long, it must cut down to the right size.

The machine's rotors holding the tools take a certain amount of time to stop rotating. This is because of how fast it turns when running at full speed (approx. 2000 rpm). On tractors featuring a power take-off that stops as soon as it is disengaged, the PTO shaft must be fitted with a device known as an "overrun" that gives the machine's rotors enough time to stop without imparting motion to the tractor's power take-off. Check the tractor's user guide or get in touch with the tractor's manufacturer or dealer to determine whether the "overrun" device is required.



WARNING! Failure to apply the overrun where one is required results in serious injury or breakage. Make sure the PTO speed matches the machine's rated speed before engaging the power take-off.

Electrical connections are made by plugging the machine; see Figure 5.2 into the relevant socket on the tractor, making sure the power cord does not get in the way of the PTO shaft or other moving parts. When making electrical connections, we recommend you check compatibility by referring to the tractor's user guide. If in any doubt, refer to the chart below or contact the tractor supplier.

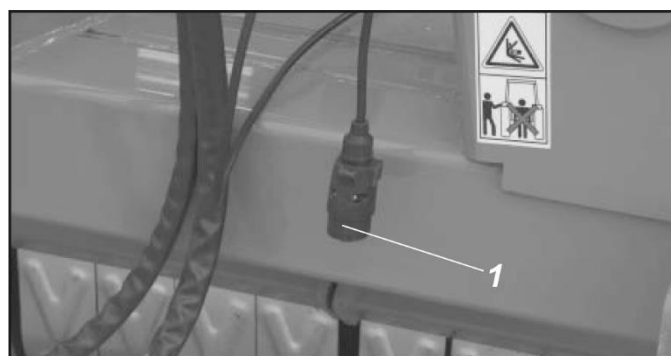


Figure 5.2

Once you have finished making the connection, lift the machine and raise the two parking stands, locking them in place with the relevant pins.

7-PIN CONNECTOR FOR 6-12V ELECTRICAL CONNECTIONS - socket and plug - numbers identifying the individual pins and their specific use.		
CHART FOR SYSTEM WITH 6- OR 7-CORE CABLE.		
N°	USE	CORE CABLE
1 L	Left indicator	Yellow
2 54 G	Rear fog light	Blue
3 31	Earth	White
4 R	Right indicator	Green
5 58 R	Right-hand tail light (right-hand sidelight); number plate light	Brown
6 54	Brake light	Red
7 58 L	Left-hand tail light (left-hand side- light); number plate light	Black
CHART FOR SYSTEM WITH 5-CORE CABLE		
N°	USE	CORE CABLE
1 L	Left indicator	Yellow
3 31	Earth	White
4 R	Right indicator	Green
5 58 R	RH and LH tail light and number plate light	Brown
6 54	Brake light	Red

5.2 Starting the machine



WARNING! Before using the machine, gain familiarity with the controls and how they work. You must wear suitable Personal Protective Equipment (PPE) when using, adjusting, servicing, repairing or handling the machine; see Section 2.4.



DANGER! Before starting work, make sure there are no people or animals within an 80m range; see Figure 5.3. The machine must be used by a single operator sitting inside the driver's cab on the tractor. In addition, before starting work, make sure ALL machine guards are intact and in perfect working order.



DANGER! Bring the machine up to operating speed gradually. Start working once the power take-off is running at full speed and gradually lower the machine into the work position. Do not run the machine under no-load conditions unnecessarily. Do not accelerate suddenly with the power take-off engaged. This could be very harmful to both the machine and tractor.



DANGER! Do not operate the machine with the rear doors open for any reason. Rear doors should be opened only for maintenance purposes with the machine not operating, and should be kept open only for as long as strictly necessary.



WARNING! Before starting work, always check that the rear door is closed and, if manually operated, that it is fastened securely with the specially provided screws.

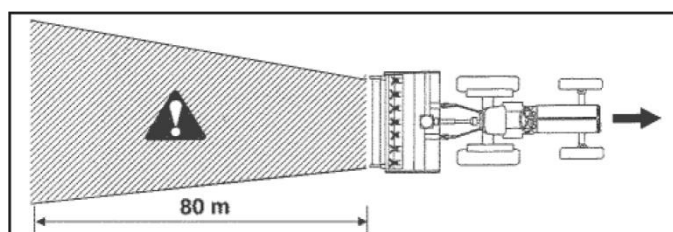


Figure 5.3

Ensure the engine of the tractor runs at a speed that will provide the machine with the power required for the job at hand.

Travel a short distance with the machine operating and check the quality of the work performed: if it is not satisfactory, repeat and review the machine's adjustments.

5.3 Commencing work

While the machine is operating, the operator must sit in the driver's seat on the tractor since this is the only position that you can operate the equipment from correctly.



DANGER! Before leaving the tractor driver's seat, once work is done, disengage the power take-off, apply the parking brake, switch off the engine, remove the ignition key and keep it on your person while any work is being performed on the machine. Because of the high speed of rotation of the rotor the flails are attached to, it can take some time to come to a complete halt, due to the inertia of the masses in question, even after the tractor has been switched off and/or the power take-off disengaged. Nobody except operators involved in the work must be allowed anywhere near the machine.



CAUTION! When changing direction, turning or reversing, lift the machine slightly off the ground to avoid damaging the structure.

5.4 Stopping the machine

- 5.4.1. Stop travel;
- 5.4.2. Reduce tractor engine speed;
- 5.4.3. Disengage the PTO control on the tractor;
- 5.4.4. Wait for the rotors to stop turning.



DANGER! Due to inertia, the rotors take a few minutes to stop turning even once the power take-off on the tractor has been disengaged.

5.5 Uncoupling the machine



DANGER! The ground the machine is parked on must be flat and cordoned off or otherwise protected to stop unauthorized personnel approaching.

When you park the machine, you must:

- 5.5.1. Apply the tractor's parking brake;
- 5.5.2. Extend/open/lower/position the machine's parking stands;
- 5.5.3. Rest the machine on the ground;
- 5.5.4. Disengage the tractor's PTO;
- 5.5.5. Stop the tractor's engine;
- 5.5.6. Remove the key from the ignition and keep it in a safe place;
- 5.5.7. Leave the driver's seat;
- 5.5.8. Disconnect the hydraulic hoses from the relevant quick couplers on the tractor;
- 5.5.9. Disconnect the PTO shaft, freeing the locking mechanism;
- 5.5.10. Rest the PTO shaft on the relevant support;
- 5.5.11. Pull out the pins and remove the adjustable top link;
- 5.5.12. Fasten the top link to the relevant support on the tractor;
- 5.5.13. Pull out the cotter pins and hitch pins and then remove the tractor's rear lower hydraulic lift arms from the machine's hitch points;
- 5.5.14. Get back on the tractor;
- 5.5.15. Start the tractor and move slowly and carefully away from the machine.

5.6 Clogging

Bear in mind that any variations in field conditions – such as the type and density of material to be shredded – can cause the machine to clog.

In the event of clogging, keep the machine running and lift it off the ground to give it time to unclog itself.

In the event of serious clogging, the rear doors can be opened to make it easier to remove material by hand. Remember that the rear doors should only be opened for maintenance purposes, for instance to remove clogging, replace broken or missing tools, remove foreign matter, etc.

Before opening the doors, make sure you have disengaged the tractor's power take-off and that the rotors have come to a halt (bear in mind that inertia can mean the rotor takes even a few minutes to stop once the power take-off has been disengaged).

Also make sure nobody is anywhere near the machine.

Once the rear hoods have been opened, switch off the tractor and remove the keys (and keep them in a safe place) before going near the rear of the machine or allowing other people to come near.



WARNING! Failure to follow these rules may expose people to the danger of serious harm or even death. The hydraulic operation of the rear door can cut off people's limbs if they are allowed near.

6 Machine Adjustments

Below are the optimum torque settings to be applied when tightening the main screws and nuts.

Bolt Size	Torque (Nm)
M12	92
M14	145
M16	229
M18	314
M20	447
M22	604

6.1 Adjusting ground speed

Adjust work speed based on the amount of material to be shredded as well as how finely it is to be chopped up. As a general rule, drive the tractor no faster than 8 km/h.

6.2 Adjusting cutting height

To adjust the cutting height of the tools, you need to adjust the position of the skids and rear rollers or wheels (optional extra).



WARNING! You need to position the tractor on a stretch of flat ground, with the engine switched off, the parking brake on, the PTO disengaged and the key removed from the ignition and kept in a safe place.

Adjust the height of the rear rollers and side skids so that the PTO is parallel to the ground when the machine is positioned parallel to the ground. Flails must work at least 20 or 30 mm off the ground. The side skids actually have to be at least 20 mm lower than the skids working range. As a general rule, the skids must always be set to a height where they will not come into contact with the ground.

6.2.1 Adjusting skid height

Please see Figure 6.1 for reference to the below procedure.

- 6.2.1.1. Loosen the screw (1);
- 6.2.1.2. Unscrew and remove the two nuts (2 and 3) and their respective screws;
- 6.2.1.3. Rotate the skid (4) so that it can be fastened on the other two holes;
- 6.2.1.4. Insert the two screws and lock them with the two nuts (2 and 3);
- 6.2.1.5. Tighten the screw (1);
- 6.2.1.6. Repeat the full procedure described above on the other side of the machine.

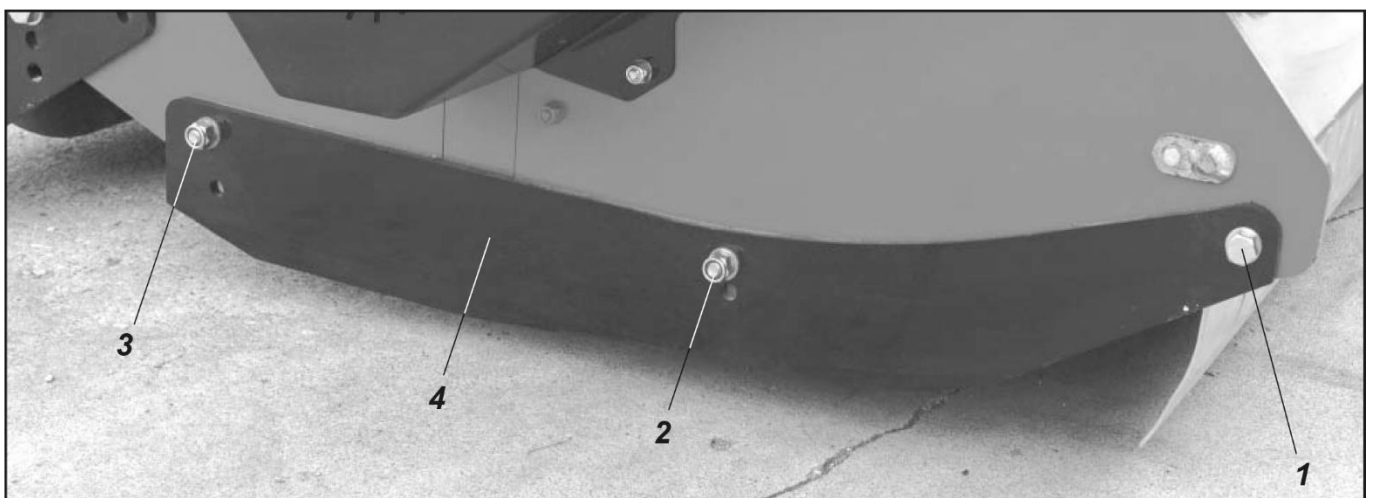


Figure 6.1

6.2.2 Adjusting rear roller height

Please see Figure 6.2 for reference to the below procedure.

- 6.2.2.1. Unscrew and remove the three nuts and their respective three screws (1, 2 and 3);
- 6.2.2.2. Repeat the operation on the other side of the roller, releasing the nuts (4, 5 and 6), and on the mid-point bracket, releasing the nuts (7, 8 and 9);
- 6.2.2.3. With the aid of lifting gear, lift the roller (10) so that it matches up with the desired holes;
- 6.2.2.4. Refit the three screws (1, 2 and 3) and lock them with their respective nuts;
- 6.2.2.5. Refit the three screws and lock them with their respective nuts (4, 5 and 6);
- 6.2.2.6. Refit the three screws and lock them with their respective nuts (7, 8 and 9);
- 6.2.2.7. Repeat the full procedure described above on the other roller.

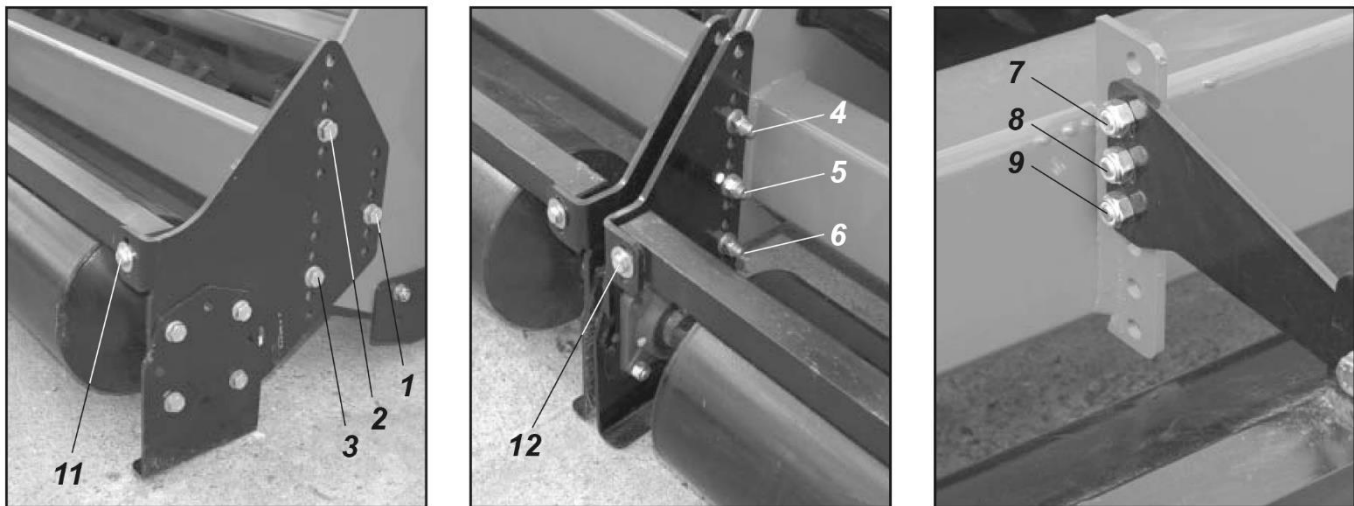


Figure 6.2



WARNING! The two rollers must always be at the same height.

Next, adjust the protective side skids; see Section 6.2.1. The roller may also feature a scraper, namely a device designed to clean the roller that, in turn, must be positioned correctly with respect to the roller. To adjust the position of the roller scraper, loosen the screws (11 and 12) and lower the scraper so that it is within 2-5 mm of the roller, making sure there is nothing to stop the roller turning freely. To finish the job, tighten the screws (11 and 12). This adjustment should also be made after a few hours of operation.



DANGER! The side skids must always be adjusted so that they are at least 20 mm lower than the flails maximum working range because of the danger of objects being flung out from the sides. Flails are adjusted correctly when they are approx. 20 or 30 mm off the ground.

6.2.3 Adjusting rear wheel height (if fitted)

Please see Figure 6.3 for reference to the below procedure.

- 6.2.3.1. Loosen the four nuts (1, 2, 3 and 4);
- 6.2.3.2. Lift or lower (A) the wheel (5)



WARNING! The wheels can be moved to the right or left, see Figure 6.3 (B).

- 6.2.3.3. Once you have achieved the optimum setting, tighten the four nuts (1, 2, 3 and 4);
- 6.2.3.4. Repeat the full procedure described above on the other wheel.

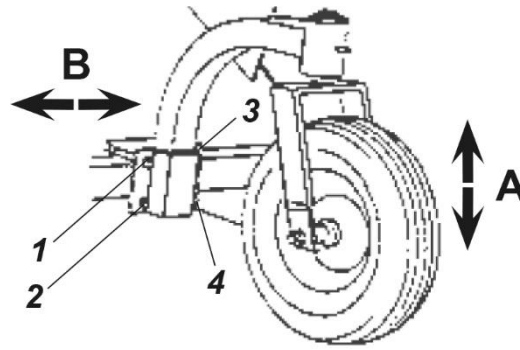


Figure 6.3

6.3 Adjusting the counter-knives (if fitted)

To work correctly, the counter-knives must be positioned at least 5 mm from the flails. Make sure this distance is complied with.



WARNING! This operation is best performed with the machine folded in the road travel position and rested on the ground.

Where necessary, pull the counter-knives forward, making sure you loosen all the screws, see Figure 6.4, that fasten them to the enclosure. This operation should also be performed when the tools become worn following several hours of operation and the height is no longer correct.



Figure 6.4



DANGER! Adjusting the counter-knives involves lifting the machine and must therefore be carried out using suitable equipment at a workshop authorized by the Manufacturer or at the Manufacturer's own facility.

6.4 Adjusting belt tension



WARNING! You need to position the machine on flat ground, with the engine switched off, the parking brake on, the PTO disengaged and the key removed from the ignition and kept in a safe place.

To determine whether the drive belts need tensioning or not, precede as follows making reference to Figure 6.5:

- 6.4.1. Insert a screwdriver in the relevant slot in the guard;
- 6.4.2. Press on one of the belts with a force of about 50 Nm; if it flexes by more than 1 cm, the belt needs tensioning;
- 6.4.3. Repeat the procedure on the other side of the machine.

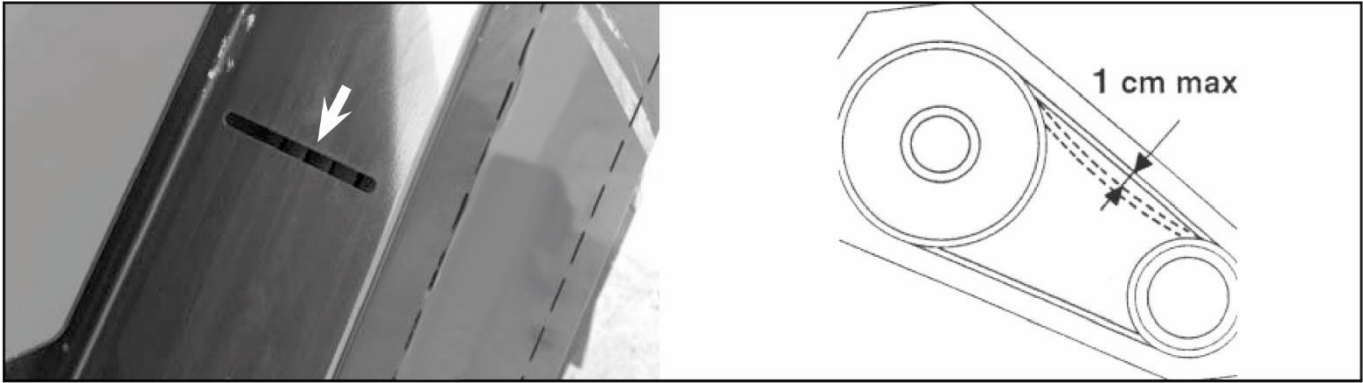


Figure 6.5

To adjust drive belt tension, precede as follows making reference to Figure 6.6:

- 6.4.4. Loosen the four nuts (1, 2, 3 and 4);
- 6.4.5. Adjust with nut (5): turning clockwise increases tension; anticlockwise slackens the belts;
- 6.4.6. Once you are happy with belt tension, tighten the four nuts (1,2, 3 and 4);
- 6.4.7. Repeat the procedure on the other side of the machine.

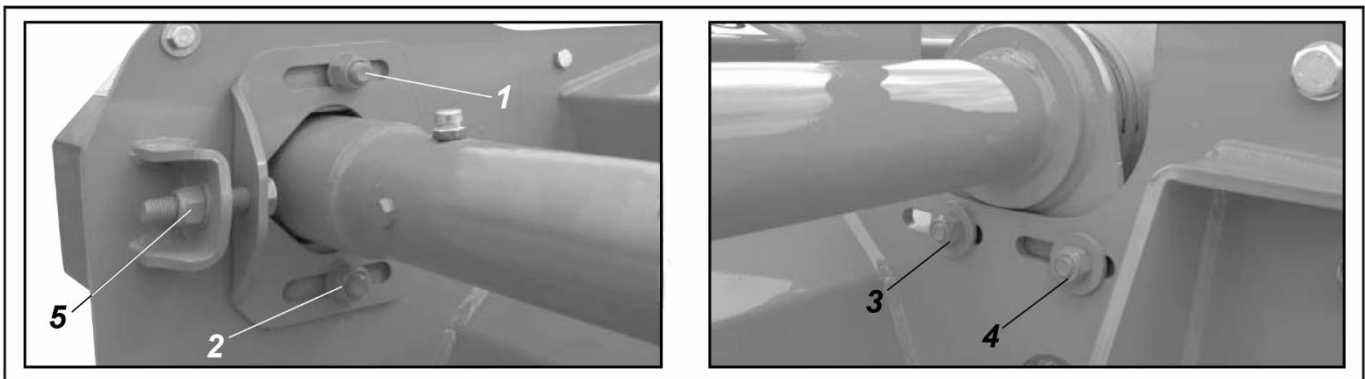


Figure 6.6

7 Maintenance



DANGER! If you experience trouble, you must switch off the tractor, remove the ignition key and get out of the tractor to determine the extent of the problem and, where necessary, perform any work required on the machine.

Remember all maintenance work must be carried out by trained and qualified personnel with the machine stopped. Maintenance and repair work must not be performed outdoors, and should instead be carried out in a suitably equipped workshop.



WARNING! You must wear suitable Personal Protective Equipment (PPE) when using, adjusting, servicing, repairing or handling the machine; see Section 2.4.



WARNING! Before performing any maintenance work, you must switch off the tractor, remove the keys (and keep them in a safe place) and disconnect the PTO shaft.



WARNING! Waste oil qualifies as hazardous waste according to current law and, as such, must not be released into the environment; it should be recovered and disposed of through suitable collection centres.

Consequently, contact your nearest environment agency concerned with the collection and disposal of waste oil before commencing any maintenance work, you must follow the procedure below:

- 7.0.1. While maintenance work is in progress, the machine must be positioned on level solid ground;
- 7.0.2. Switch off the tractor's engine, apply the parking brake and remove the key from the ignition;
- 7.0.3. Always use suitable Personal Protective Equipment (safety footwear, overalls, work gloves and dust mask); see Section 2.4;
- 7.0.4. Take all accident-prevention precautions prescribed for the job at hand;
- 7.0.5. If you are using compressed air to clean the machine, you must wear suitable eye protection;
- 7.0.6. Do not perform repairs you are not familiar with. Always follow the instructions and, if none are available, seek advice from the supplier or expert personnel;
- 7.0.7. Replace hydraulic hoses whenever they are damaged and, in any case, at least every 5 years;
- 7.0.8. Do not use any lifting points other than those provided for this purpose; see Figure 2.2 and Figure 3.1;
- 7.0.9. Make sure the hoisting device chosen is suitable for the job at hand in compliance with safety standards;
- 7.0.10. Do not keep the tractor's engine running indoors where there is no ventilation system to remove harmful exhaust gases that build up in the air;
- 7.0.11. Avoid prolonged and repeated contact with fuels/lubricants/fluids on the skin as they could cause skin disorders or other syndromes;
- 7.0.12. Do not swallow fuels/lubricants/fluids. In case of accidental contact with eyes, flush the affected part with plenty of water;
- 7.0.13. Take extra care around oil/emptied fluid, which can be very hot;
- 7.0.14. Do not perform welding indoors or anywhere without sufficient ventilation;
- 7.0.15. Do not perform welding on or around painted surfaces to avoid the release of toxic vapours. Remove paint with suitable products, then wash the surfaces and allow them to dry;
- 7.0.16. Vent pressure from circuits before performing any work on them;
- 7.0.17. Do not use hands to search for pressurized fluid leaks;
- 7.0.18. Escaping fluid under pressure can penetrate the skin and eyes with extremely serious consequences.

7.1 Maintenance work that can be performed by the operator

The work described in the following points does not require any special expertise. The operator must be familiar with the procedures and follow the relevant instructions carefully, and must put the machine out of service first. Routine checks and maintenance work must be performed at the stated intervals following the procedures given and are the responsibility of the operator. Failure to comply with maintenance rules and intervals has a negative effect on machine operation and its service life and, consequently, shall void the warranty. Perform maintenance at shorter intervals when working under demanding operating conditions (frequent stopping and starting, lengthy winter season, e.t.c).

7.2 Hot points on the machine

Before performing any maintenance work, make sure parts of the machine that can get hot have been allowed to cool, namely:

- Gearbox (speed increaser);
- Central gearbox (transfer);
- Drive shafts;
- Right- and left-hand drive belt guards;
- Drive belts;
- Drive pulley;
- Rotor mounts (opposite side to drive belts).

7.3 Greasing

Only use a manual grease pump to avoid busting the seals on the bearings and pipes the grease travels through.

Use **SKF LGHT3 grease or equivalent grade. Grease the points indicated below daily.**

- PTO shaft, see Figure 7.1 (also see relevant manual);
- Rotor, on both sides of each of the two rollers, see Figure 7.2;
- Rear rollers, on both sides of the machine, see Figure 7.3;
- Cylinder and lift arm, on both sides of the machine, see Figure 7.4;
- Rear support wheels (optional extra), see Figure 7.5.

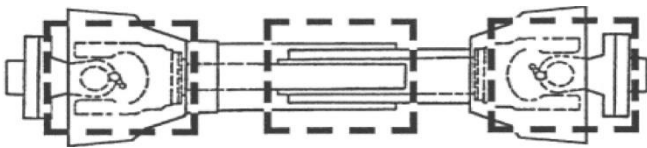


Figure 7.1



Figure 7.2

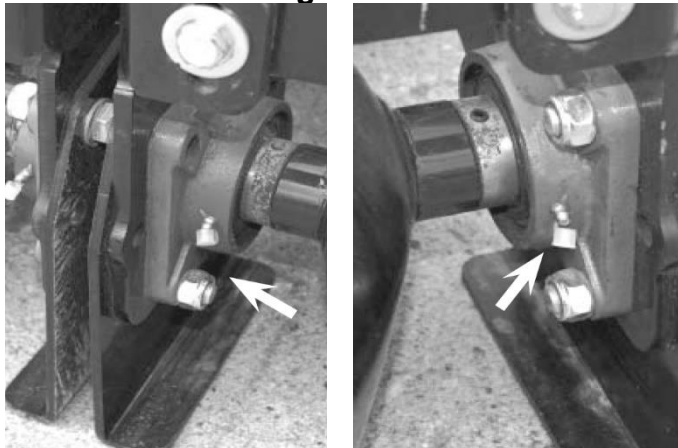


Figure 7.3

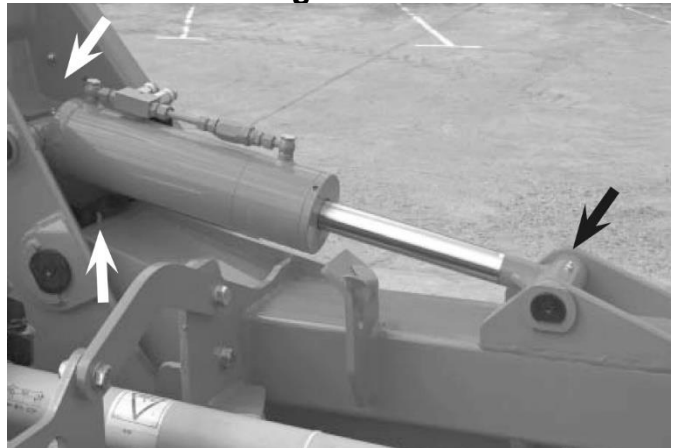


Figure 7.4

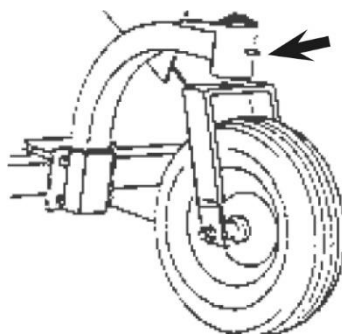


Figure 7.5

7.3.1 Greasing requirements - daily

- 7.3.1.1. Make sure bolts fastening the tools are tightened properly;
- 7.3.1.2. Check tools for wear and damage;
- 7.3.1.3. Check that welds are in a good state of repair; if you see any cracks, do not attempt to use the machine at all and instead contact an authorized workshop or the manufacturer;
- 7.3.1.4. Check that the flaps are in a good state of repair and, if they are damaged, replace them immediately;
- 7.3.1.5. Check that the tyres on the rear support wheels (optional extra) are in a good state of repair.

7.3.2 Greasing requirements – every 50 hours

- 7.3.2.1. Check oil level in the gearbox. Oil should just come up to the lower edge of the plug hole, see Figure 7.6; if you need to top up, use the vent cap, see Figure 7.6. Use EP90 or equivalent grade oil.
- 7.3.2.2. Check oil level in the two drive shafts. Oil should just come up to the lower edge of the oil level plug, see Figure 7.7; if you need to top up, use the vent cap, see Figure 7.7. Use EP90 or equivalent grade oil.
- 7.3.2.3. Check drive belt tension; see Section 6.4.

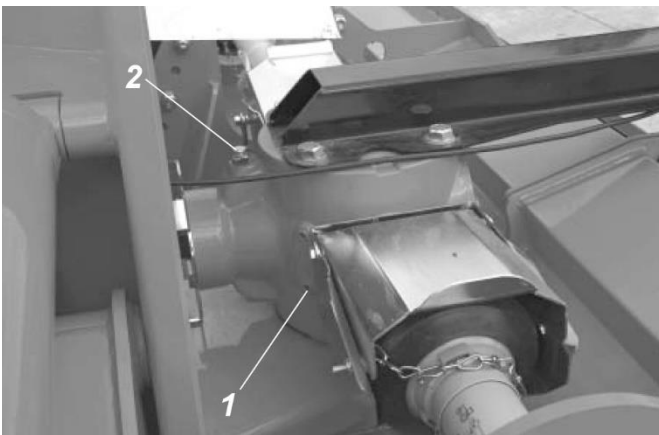


Figure 7.6

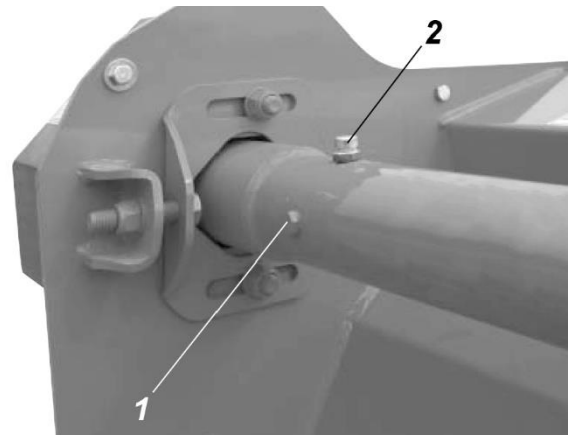


Figure 7.7

7.3.3 Greasing requirements – every 400 hours

- 7.3.3.1. Change gearbox oil;
- 7.3.3.2. Have a ...litre capacity container ready near the gearbox;
- 7.3.3.3. Remove the vent cap, see Figure 7.6 (2);
- 7.3.3.4. Use a suitable pump to pump all the oil out through the plug hole, see Figure 7.6 (2), catching it in the container you procured earlier;
- 7.3.3.5. Remove the oil level cap, see Figure 7.6 (1);
- 7.3.3.6. Use EP90 or equivalent grade oil;
- 7.3.3.7. Pour oil into the gearbox through the vent cap hole, see Figure 7.6 (2);
- 7.3.3.8. When oil starts coming out of the plug hole, see Figure 7.6 (1), you have reached the correct oil level;
- 7.3.3.9. Refit the plug and cap, see Figure 7.6 (1 and 2).



DANGER! Waste oil qualifies as hazardous waste according to current law and, as such, must not be released into the environment; it should be recovered and disposed of through suitable collection centres.

You must contact the relevant environment agency in your country for the collection of waste oil.

7.4 Hydraulic system

Visually inspect the machine for loose fittings and scrapes, cuts or other signs of wear on hoses. Tighten loose fittings and replace worn or damaged hoses.

7.4.1 Replacing a hydraulic hose

Before starting to replace a hydraulic hose, make sure you take all the safety measures prescribed for maintenance work, stop the machine and close the hydraulic system valves.

- Make sure you have vented the residual pressure from the system.
- Determine exactly which hose is damaged and loosen the two relevant connection points with a suitable spanner, watching out for any hydraulic fluid that may come out.
- Replace the damaged hose with original spare parts only.
- Replace hydraulic hoses within 5 years of the machine's delivery, if not sooner.
- Make sure connection points (threads, seals, etc.) are in a perfect state of repair before installing the new hose.
- Use suitable spanners to tighten hydraulic hose fittings clockwise if they are leaking. Do not overtighten them or you risk damaging the fittings' thread.

7.5 Flails

7.5.1 Inspecting for wear

The flails must be inspected visually for wear each time before starting work, see Figure 7.8. Replace flails when you notice an increase in power demand or see that material is not being cut perfectly. Using the machine with flails that are not sharp will have a negative effect on the quality of the work.

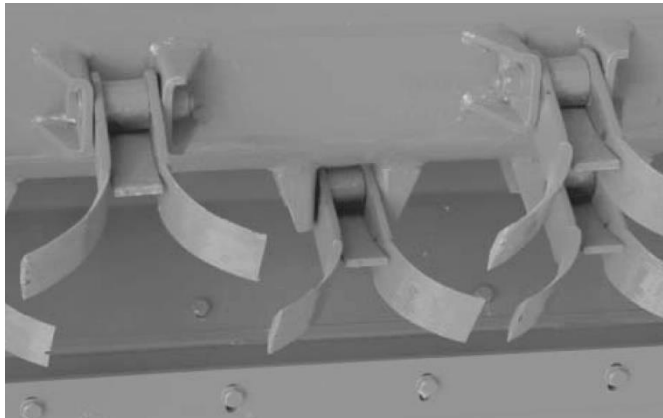


Figure 7.8

7.5.2 Replacing the flails

When the flails wear at a different rate or some are broken, they must be replaced immediately. The new flail should be mounted in the identical position of the one to be replaced and should be of equal weight and length in order not to jeopardise the balance of the whole machine.



WARNING! When a flail needs replacing, it is best to replace the whole series. Failure to fit original tools may cause the machine to vibrate abnormally.



WARNING! When replacing flails with the machine lifted off the ground, do not rely on the tractor's hydraulic lift to hold it up: wedge mechanical props or supporting trestles between the machine and the ground to stop the head dropping accidentally and posing a serious hazard.



WARNING! Whatever the case, the cutting edge of the flail should face in the direction the rotor rotates. The tractor should be switched off and the handbrake applied during flail replacement and the ignition key should be with the operator. Flails must be removed and fitted, as illustrated in the figures below, by inserting the bolt through the bush and tool, with the two washers threaded on either side, and fastening it with the relevant nut, see Figure 7.9.

The flails that can be fitted to the machine are as follows:

- Single (Figure 7.10);
- Double with Blade (Figure 7.11);
- Double with Spacer (Figure 7.12);
- Side-Slice Knives
- Cupped knife (Figure 7.13);
- Hammer (Figure 7.14).

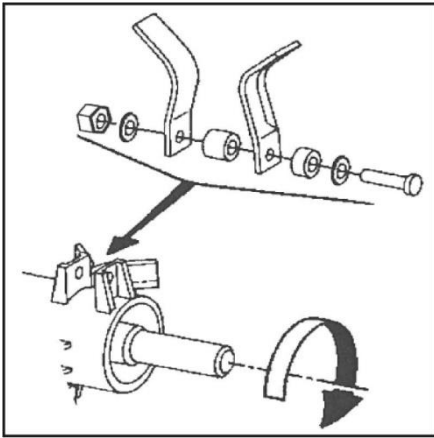


Figure 7.9

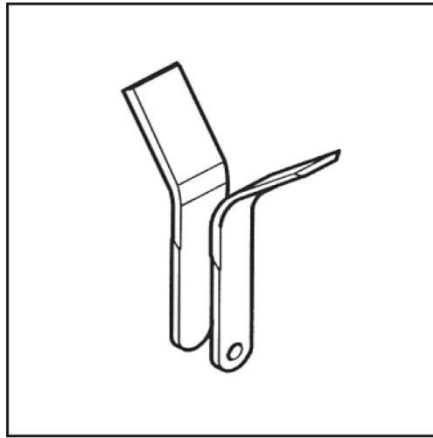


Figure 7.10

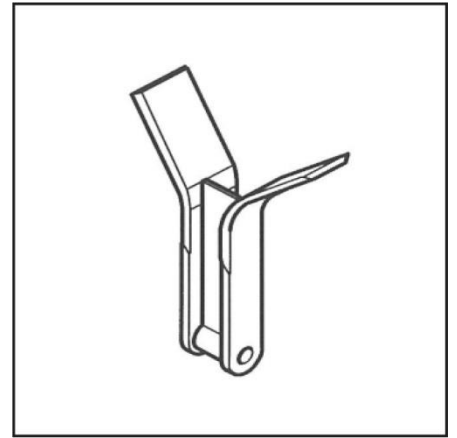


Figure 7.11

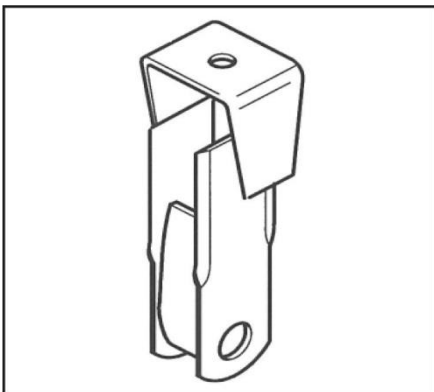


Figure 7.12

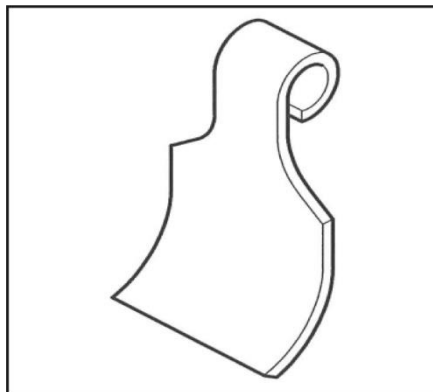


Figure 7.13

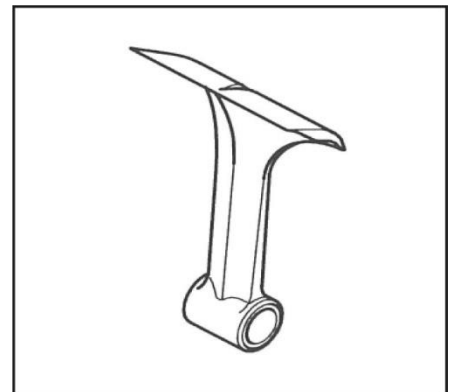


Figure 7.14

7.6 Drive belts

7.6.1 Replacing drive belts

Worn belts become stretched, meaning it is always a good idea to replace all belts to ensure forces are distributed correctly. Drive belts should be replaced with the machine rested on the ground, with the tractor switched off, the PTO disengaged, the parking brake on and the key removed from the ignition.

If routine checks reveal that belts are too worn - you can see that they are broken, fraying, splitting or otherwise damaged - replace them by proceeding as follows.

- 7.6.1.1. Unscrew and remove the five nuts, see Figure 7.15 (1, 2, 3, 4 and 5);
- 7.6.1.2. Remove the guard; see Figure 7.15 (6);
- 7.6.1.3. Loosen the 4 nuts, see Figure 6.6 (1, 2, 3 and 4);
- 7.6.1.4. Turn the nut, see Figure 6.6 (5), anticlockwise so that the belts go completely slack;
- 7.6.1.5. Replace the worn and/or damaged belt.

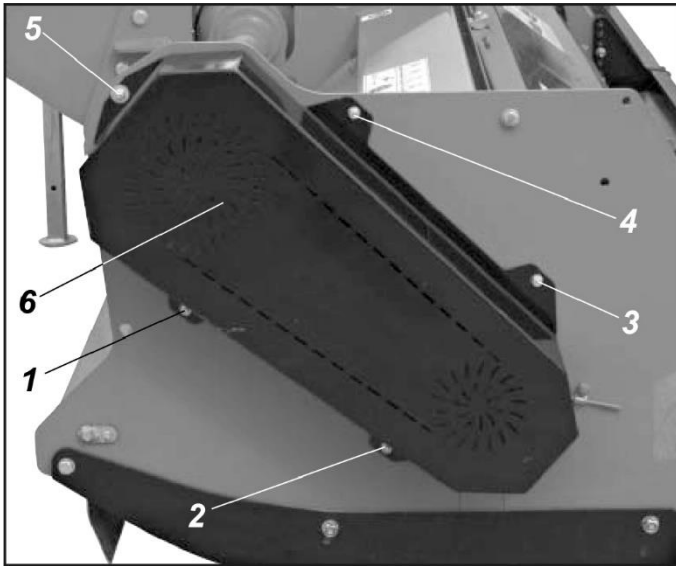


Figure 7.15

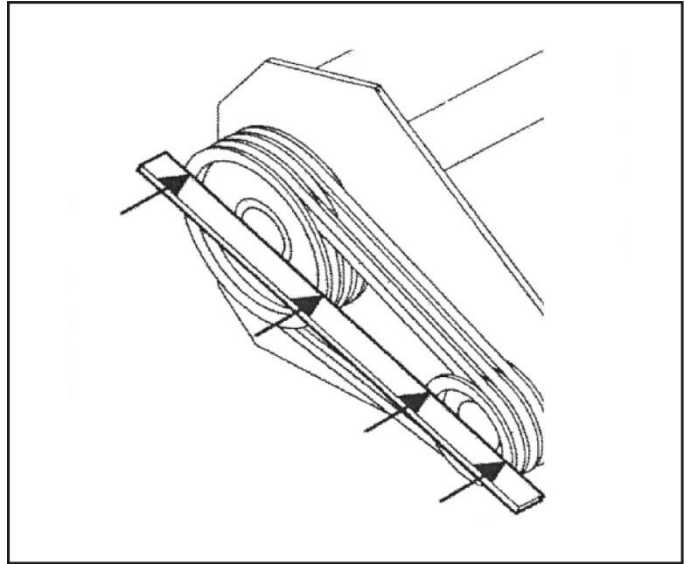


Figure 7.16



WARNING! For optimum power transmission, it is best to replace the whole belt unit.



CAUTION! When tensioning the belts, special care must be exercised to ensure the pulleys remains parallel. Do this by procuring a metal rule of a suitable length and resting it against the edges of the two pulleys as shown in Figure 7.16; make sure the rule touches all four edges of the pulleys in question.

7.6.1.6. Refit the guard, see Figure 7.15 (6);

7.6.1.7. Refit and tighten the five nuts, see Figure 7.15 (1, 2, 3, 4 and 5);

7.6.1.8. Once you have finished replacing the belts, adjust tension as described in Section 6.4;

7.6.1.9. Where necessary, repeat the procedure described on the drive unit on the other side of the machine.

7.7 Extraordinary maintenance

Extraordinary maintenance consists of replacing machine parts other than belts or flails and which entails the use of equipment and a certain degree of professionalism.



WARNING! All and any maintenance operations not covered in the extraordinary maintenance section should be carried out at the manufacturer's authorised workshops or by the actual manufacturer.

7.8 Scheduled maintenance table

DESCRIPTION		COMPULSORY CHECKS	MAINTENANCE INTERVALS		
		EVERY 8 HOURS	EVERY 50 HOURS	EVERY 400 HOURS	EVERY 5 YEARS
GENERAL MACHINE CHECKS	Grease	X			
	Check bolt tightness	X			
	Check tools for wear	X			
	Check drive belt tension		X		
	Replace tools			X	
	Replace drive belts			X	
HYDRAULIC SYSTEM	Check tightness of hydraulic hose fittings		X		
	Replace hydraulic hoses				X
GEARBOX	Check gearbox oil level		X		
	Change gearbox oil			X	
	Check oil level of drive shafts		X		

7.9 Cleaning the machine

- Clean the machine at regular intervals, using a water blaster, focussing above all on any flammable materials left on the machine. Make sure there is no straw, hay or flammable material left on any parts of the machine that get hot.
- Make sure the machine's cables are in a good state of repair. Should you find that the jacket is worn or damaged, replace the cable in question.
- Where necessary, use mild biodegradable detergents, complying with pollution prevention regulations when it comes to disposing of the waste cleaning water.
- Dry the machine immediately after washing.
- Do not use solvents, benzene or diesel oil, which could cause early deterioration of the gaskets and other plastic elements as well as be a risk for lubrication of the machine in general.



WARNING! Only carry out cleaning operations with the machine disconnected from the tractor. Also simple cleaning away of any residues of vegetation must always be carried out with the tractor engine switched off and the hand brake on, keeping the ignition key in a pocket.

8 Accessories

8.1 List of accessories



WARNING! To ensure the safety of persons, only use original accessories which, having been specifically designed for the use for which they are destined, ensure the reliability required in the working conditions in which it is intended to use the machine. For complete reliability, the accessories should be installed by specialised personnel at the manufacturer's authorised service centres or at the actual manufacturer's premises.

Spearhead Machinery is available for any service requirements. Spearhead Machinery has prepared a range of accessories which allow the performance of its equipment to be improved, making them more effective and versatile. The available accessories for the flail mower are given in the table below:

ACCESSORY	DESCRIPTION
Hydraulic Door opening	Device designed to control opening of rear doors hydraulically.
Protective Skids with lower plate	The protective side skids come with a plate that allows the machine to glide over the ground, aiding the roller in taking the weight of the machine.
Rear rollers	Used instead of wheels, the rollers support the machine at the back, keeping it the correct distance off the ground.
Rear wheels	Used instead of rollers, the wheels support the machine at the back, keeping it the correct distance off the ground.

Spearhead Machinery will be happy to answer any queries you may have regarding the use of accessories. Please remember that accessories must be fitted at an Authorized Centre or at the Manufacturer's facility.

8.2 Method for requesting accessories

Accessories should be requested by contacting your nearest Spearhead Machinery dealer, supplying the following information:

- Type of machine (accessory is to be installed on)
- Serial Number
- Year of Manufacture
- Type of shipment required

These data may be found on the machine Identification plate, see Figure 1.4. Please also describe the part you require and the quantity you would like to order.

If you are unsure of where your nearest Spearhead Machinery dealer is, then visit www.spearheadmachinery.com/dealer-locator/

The term "right" or "left" indicated in the descriptions should be understood as being in relation to the driver's seat on the tractor. The customer should specify the type of shipment; otherwise Spearhead may choose the type of shipment it deems most suitable. Under no circumstances may Spearhead Machinery be held liable for any delays in shipment. Transportation expenses are always charged to the Receiver. The goods always travel at the customer's risk, even if sold carriage paid.

9 Troubleshooting

If the flail mower malfunctions, search the causes and the solution of the problems in the following table:

PROBLEM	CAUSE	SOLUTION
Uneven cutting finish	Flails worn or damaged	Replace flails
	Machine not adjusted properly	Perform adjustments
	Machine clogged	Decrease ground speed
Flails wear out too quickly	Stony ground	Inspect ground for stones before work
	Flail cutting height too low	Adjust cutting height
Machine noisy	Rotor not balanced	Balance at a specialist repair workshop
	Flails damaged, worn or missing	Replace flails
	Worn bearing	Replace bearings

10 Spare Parts

For routine maintenance or repair spare parts may be obtained from the Spearhead parts department.

To obtain correct part numbers; either refer to the parts manual specific to the serial number of your machine; which is supplied in a document holder attached to the machine; or, use the Spearhead on-line parts books. These are available at dealerinside.spearheadmachinery.com/partsmanuals/manual.aspx. You will need to enter the machine serial number. The correct part numbers must be quoted when ordering spares.

11 Warranty Information

Despite our best efforts to ensure that your new machine is delivered on time, works correctly and is defect free, some defects do infrequently slip through our quality net. Equally, when in use, accidents happen and damage is caused. To cover these situations Spearhead operates a Warranty policy.

11.1 Warranty policy

11.1.1 Warranty registration

All machines must be registered, by the selling dealer with Spearhead, 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.

11.1.2 Limited warranties

All machines supplied by Spearhead 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.

All spare parts supplied by Spearhead and purchased by the end user 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. All parts warranty claims must be supported by a copy of the failed part invoice to the end user. We cannot consider claims for which sales invoices are not available.

The warranty offered by Spearhead is limited to the making good by repair or replacement 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. Pack the component(s) carefully so that any transit damage is avoided. All ports on hydraulic items should be drained of oil and securely plugged to prevent seepage and foreign body ingress. Certain other components, electrical items for example, may require particular care when packing to avoid damage in transit.

This warranty does not extend to any product from which Spearhead's serial number plate has been removed or altered.

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, belts, clutch linings, filter elements, flails, flap kits, skids, soil engaging parts, shields, guards, wear pads, pneumatic tyres or tracks.

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

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. 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 cannot be held liable, and may have safety implications.

If in exceptional circumstances a non-Spearhead part is used to affect a repair, warranty reimbursement will be at no more than Spearhead's standard dealer cost for the genuine part.

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

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

- Hoses, exposed pipes and hydraulic tank breathers.
- Filters.
- Rubber mountings.
- External electric wiring.
- Bearings and seals

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.

Repeat or additional repairs resulting from incorrect diagnosis or poor quality previous repair work are excluded from warranty.

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 cannot be held responsible for any failures or safety implications that arise due to the use of non-genuine parts.

11.1.3 Remedies and procedures

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

Any fault must be reported to an authorised Spearhead 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 cannot be held liable.

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. Please note that failure by the customer to release the machine for repair will not be accepted as a reason for delay in repair or submitting warranty claims.

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

Following examination of the claim and parts, Spearhead will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by Spearhead and appropriate labour and mileage allowances if applicable.

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

Any decision reached by Spearhead is final.

11.1.4 Limitation of liability

Spearhead 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.

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

Except as provided herein, Spearhead 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.

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.

11.1.5 Miscellaneous

Spearhead 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.

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.

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

11.2 How to make a claim

In the event of a warranty claim being made, the process of making a claim will be carried out entirely by your selling agent. This is an arrangement that exists between Spearhead Ltd and its agents. All claims will be made via the Spearhead web site.

Qualifying warranty claims can only be made providing the machine has been previously registered with Spearhead by the selling dealer within 10 days of delivery and installation.

The correct part numbers must be quoted when ordering spares, see section 11.3 below.



IMPORTANT: Any pumps, motors gearboxes, rams or electric control units fitted to any machine that fails during the first twelve months of warranty must be returned to us unexamined. Warranty will be rejected if they have been dismantled. This only applies to the first twelve months of warranty.

11.3 How to obtain the correct spare part numbers

For correct part numbers; either refer to the parts manual specific to the serial number of your machine; which is supplied in a document holder attached to the machine, or, use the Spearhead on-line parts books. These are available at dealerinside.spearheadmachinery.com/partsmanuals/manual.aspx. You will need to enter the machine serial number.

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