

Spearhead Machinery
Operator Instruction Manual For

SNIPER HD OFFSET

2.30-2.50m cut width, 540 PTO input

Vegetation control variable offset folding flail mower

8999144EN v1.5

IMPORTANT

Verification Of Warranty Registration

Dealer Warranty Information & Registration Verification

It is imperative that the selling dealer registers this machine with Spearhead before delivery to the end user.

Failure to do so may affect the validity of the machine warranty.

To register machines go to the Spearhead Machinery Limited web site at:

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

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

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

Registration Verification

Model Type:		Sniper HD Offset
Model Number:		4.99
Serial Numbers:	Machine:	S
	Cutting Implement:	S
	Other:	
Name Of Owner:		
Name Of Installing Dealer:		
Dealer Address:		
Dealer Signature:		
Date Of Delivery / Installation:		
Date Of Warranty Registration:		

IMPORTANT

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

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

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

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Sniper HD Offset Flail Mower

This manual includes instructions for installation, use and maintenance of the Sniper HD Offset flail mower in the following sections simply called "Mower". The mower models part of this Instructions Manual, which are essentially different based on dimensions and work width, are the following:
Sniper 230 HD Offset, Sniper 250 HD Offset.

The Mower is designed and engineered to perform cleaning tasks from twigs and weeds of embankments, roadsides, scarps or, simply vineyards and orchards. 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 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 Mower is integral and complete in all its parts. Any complaints must be presented in writing within 24 hours 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

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

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

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

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

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

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

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

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Contents List

1	Description and Main Characteristics	8
1.1	Mower Description	8
1.2	Intended Usage	9
1.2.1	Allowed Uses	9
1.2.2	Improper Uses	9
1.3	Machine Identification	10
1.4	Technical Data	10
1.5	Sound Level	11
2	General Safety And Accident Prevention Standards	12
2.1	Level Of Danger	12
2.2	Terminology	12
2.3	Danger Plates And Warning	14
2.3.1	Proposition 65	18
2.4	Clothing	18
2.5	Ecology And Pollution	18
2.5.1	Disposal	19
2.5.2	Storage	19
2.6	Safe Use	19
2.7	Safe Maintenance	21
3	Installing The Mower	22
3.1	Delivery	22
3.2	First Use	23
3.2.1	Prior To Installation	24
3.2.2	Application To The Tractor	24
3.2.3	Antishock System	26
3.2.4	Flotation Pin	26
3.2.5	Input PTO Shaft	27
4	Usage Instructions	28
4.1	Before Use	28
4.2	Control System	28
4.3	Machine Settings	29
4.3.1	Adjustment Of The Skids And Roller	29
4.3.2	Adjustment Of Working Height	29
4.3.3	Adjustment Of Mower Working Position	30
4.4	Using The Mower	31
4.5	After Use	32
4.6	Safety Devices	33
4.7	Machine Transport Procedure	34
5	Maintenance	36
5.1	Periodic Maintenance	37
5.1.1	Maintenance On The Flails	37
5.1.2	Belt Maintenance	38
5.2	Spring Breakback Setting - Antishock System	40
5.3	Cleaning The Mower	41
5.4	Lubricants	41
6	Troubleshooting	42
7	Spare Parts	44
7.1	How To Obtain The Correct Spare Part Numbers	44
7.2	Spare Parts Ordering	45
7.3	Dealer Network	45

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1 Description and Main Characteristics

1.1 Mower Description

Referring to Figure 1, the Mower is a machine designed and built to perform cleaning tasks from twigs and weeds of embankments, roadsides, scarps or, simply, vineyards and orchards. It can be used both central and offset, offers a work angle of +90 to -55 with variable offset displacement depending on the model used. It must not be used for other purposes or with other materials.

The Mower consists of the following parts:

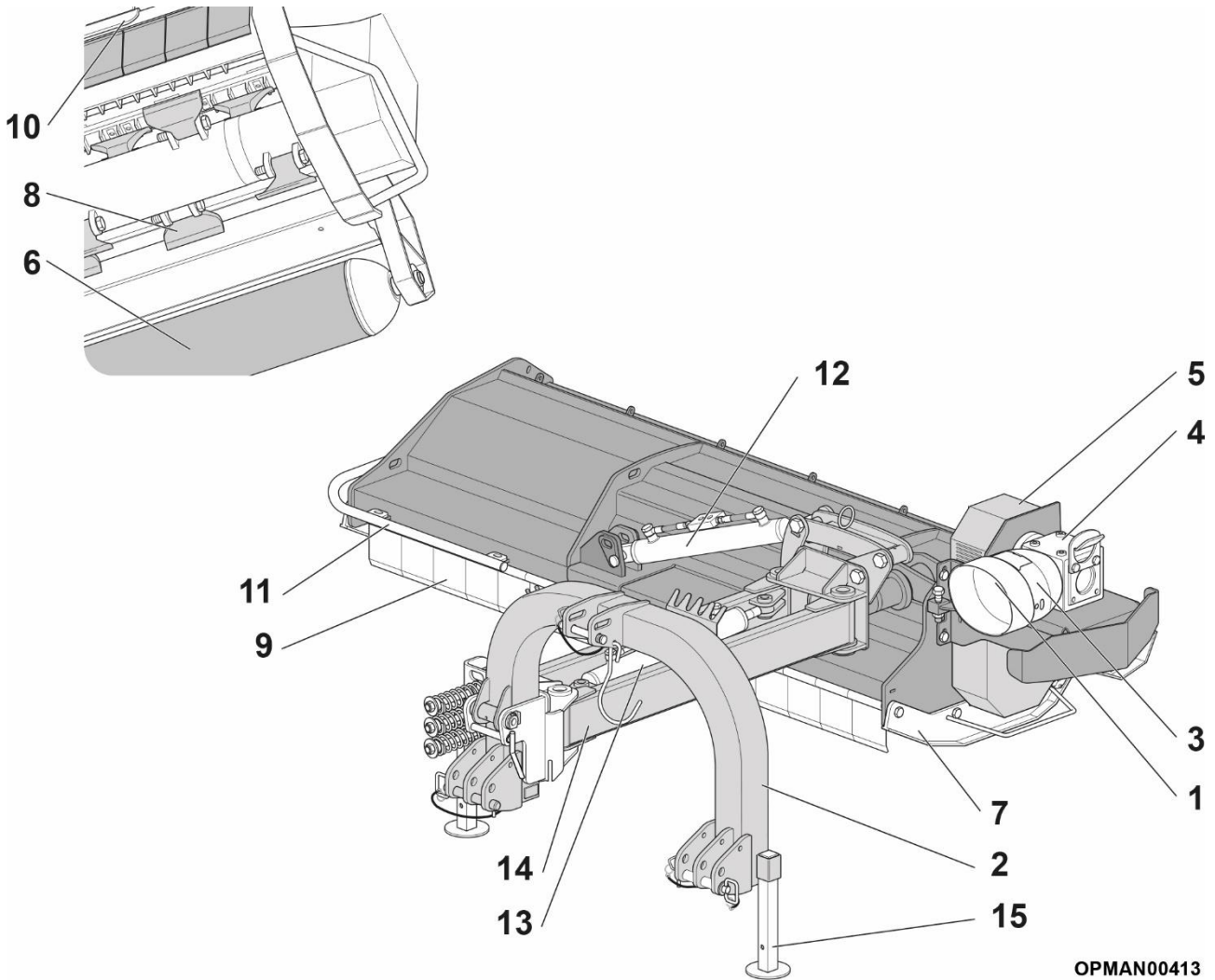


Figure 1

Item No.	Description
1	Power take-off coupling
2	Three-point hitch
3	Input PTO Shaft protective casing
4	Gearbox with free wheel
5	Belt drive transmission
6	Rear roller
7	Skids
8	Rotor shaft with flails

Item No.	Description.
9	Steel flap guard protection
10	Inspection hood
11	Nudge bar
12	Wing angle ram
13	Parallel offset ram
14	Parallel linkage arms
15	Stand

Table 1

The Mower (Figure 1) basically consists of a closed steel cowl structure in which a rotor shaft with flails is installed (8) and, on the rear side, a rear roller (6) to compact the terrain following the mowing phase. In the front part of the Mower there are two parallel arms (14) with a joint on both the machine side and on the part of the frame with three-point connection, for fastening to the tractor, whose purpose is to support the machine during work and transfer phases. A hydraulic ram (13) attached to parallel linkage arms allow the horizontal movement positioning during operation. A second hydraulic ram (12) lets you angle the Mower to fit the slope of the embankment to work, or you can put it in a vertical position for road transfer. Control for the rams is obtained from the hydraulic cab controls on the tractor by connecting the hydraulic hoses to the ports on the actual tractor. The upper part of the machine is protected by a metal cowl hood that can be opened (10) to allow the inspection of the rotor shaft and the flails, which must be carried out with the machine stopped disconnected from the tractor. The lower part is protected by a number of sheet metal flaps (9) which prevent the soil and/or fragments of plants from being projected outwards. The Mower is powered by the supporting agricultural tractor engine by connecting the gearbox (4) to the PTO of the tractor itself with the input PTO shaft. The gearbox allows a pre-set number of revolutions to be reached for the rotor shaft to rotate via a pulley and belt lateral transmission system (5).



DANGER! It is forbidden to operate the Mower when it is upright or in general when the rotor shaft is not directed towards the ground.



DANGER! It is forbidden to open the inspection hood until the Mower is in operation or is connected through shaft to the tractor.

1.2 Intended Usage

1.2.1 Allowed Uses

The Mower has been designed and built for maintenance of green areas or to mow twigs, corn, pruning residue and planting in general. When the 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 Mower for shredding plant residue, both herbaceous and woody.
- The Mower must not be used for purposes other than those described in this manual.

1.2.2 Improper Uses

The Mower, due to its typical construction, may also be suitable for uses other than from those foreseen by the manufacturer. For this reason, Spearhead has selected, as non-exhaustive examples, a series of improper uses that can be reasonably foreseen, which are:

- Using the Mower to mow or cut tree branches.
- Using the Mower to mow or cut hedges.
- Using the Mower for shredding purposes near frequented areas.

The uses listed above and those not specifically indicated in this manual, including reasonably foreseeable improper uses, are **strictly prohibited**.



Spearhead declines any and all liability for damages caused by the 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.

1.3 Machine Identification

Each machine is equipped with a serial plate; see Figure 2 that includes the following data in this order:

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

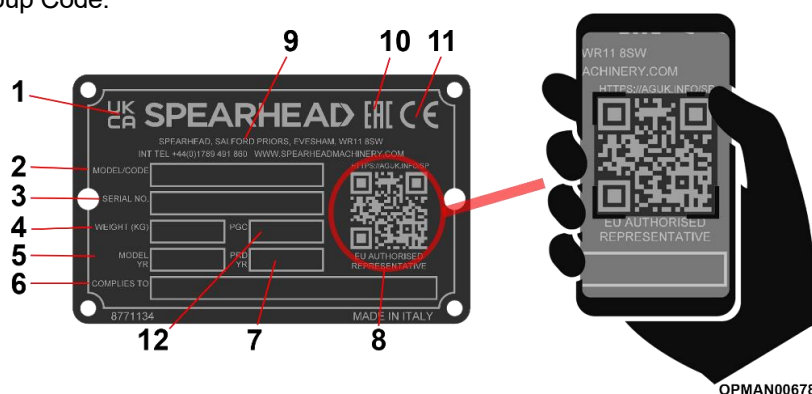


Figure 2 – Serial Plate

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

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

By utilising a smart phone and scanning the Authorised Representative QR scan code found on the right-hand side of the serial plate (ref 8, Figure 2) using a suitable QR scanning App, you can find details for Spearhead Machinery authorised representatives for its various territories.

1.4 Technical Data

Model	Working Width (cm)	Minimum Tractor HP Requirement	Number of Flails	Weight (kg)	Dimensions (W x L x H) cm
Sniper 230 HD Offset	230	130-180	20/60	1130	286 x 210 x 116
Sniper 250 HD Offset	250	140-180	22/66	1180	316 x 216 x 116

Table 2

Hitch to the tractor
 Hitch category
 PTO input speed
 Primary transmission
 Secondary transmission
 Cut height adjustment
 Cowl angle adjustment
 Cowl offset adjustment
 Type of connection to the tractor
 Minimum tractor weight

3-point universal
 CAT 2
 540 rpm
 Input Shaft
 Belts
 Mechanical
 Hydraulic
 Hydraulic
 4 x standard hydraulic couplers
 See Section 4.7

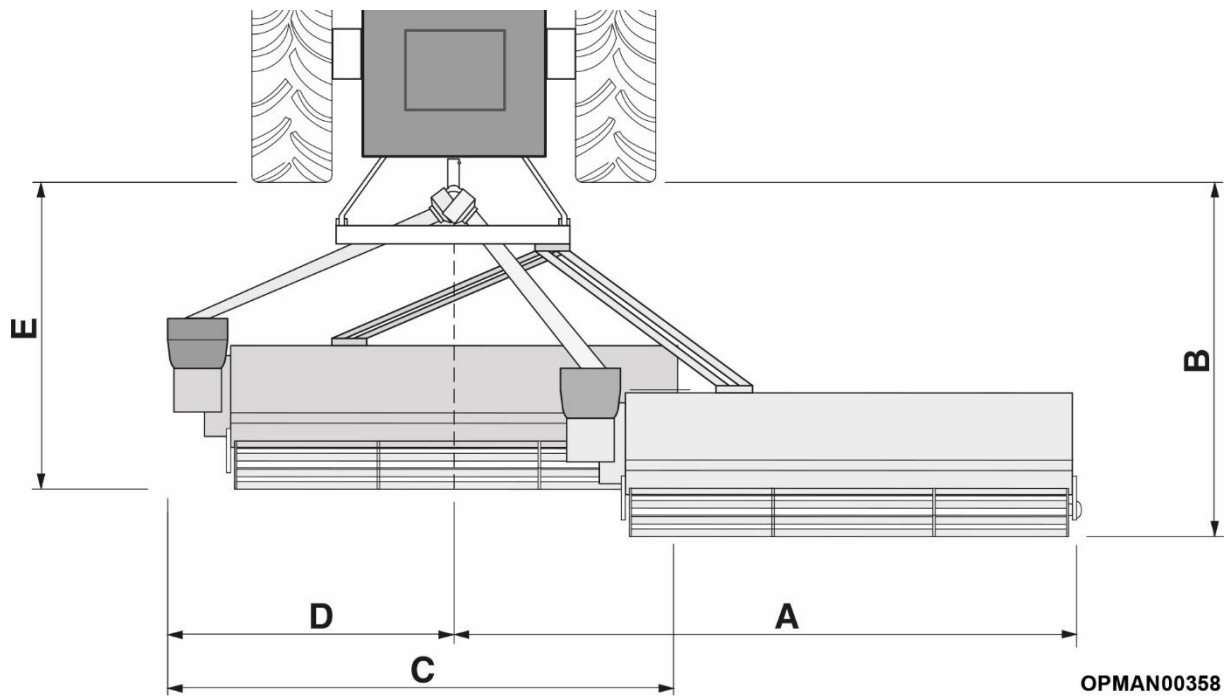


Figure 3

Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
Sniper 230 HD Offset	3200	1950	2860	750	1800
Sniper 250 HD Offset	3500	1950	3160	750	1800

Table 3

1.5 Sound Level

The air noise level created by the Mower under operating conditions was detected using a sound level meter with integrator.

The measurements were carried out at the operator station with the Mower activated empty. Tests performed under the conditions indicated by the standard produced the following results:

Tractor with open cab:

Equivalent weighted sound pressure average level: $L_{pAm} = 80.7 \text{ dB(A)}$.

Tractor with closed cab:

Equivalent weighted sound pressure average level: $L_{pAm} = 78.8 \text{ dB(A)}$.

-Sound power level: $L_{wA} = 107.1 \text{ dB(A)}$.

2 General Safety And Accident Prevention Standards

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, 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! 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! 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! 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.
- **USER:** the person, entity or company, who purchased or rented the machine and intends to use it according to the intended use foreseen by the manufacturer.
- **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 operator's manual.
- **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.
- **GENUINE SPEARHEAD DEALER/ AUTHORIZED TRACTOR DEALER:** The Genuine Spearhead Dealer/ Authorized Tractor Dealer, 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.

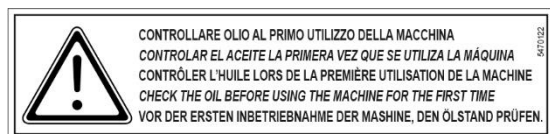
2.3 Danger Plates And Warning

The Mower is equipped with pictograms (labels) warning about residual risks present on the machine that it were not possible to eliminate. Figure 4 shows the meaning of symbols contained in the pictograms. The operator must memorise the meaning of the symbols.

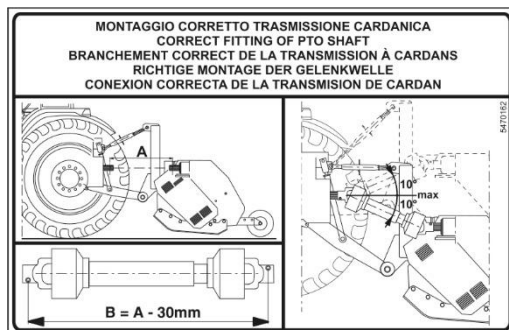
The labels should always be kept clean and replaced immediately if they are fully or partially detached or damaged.



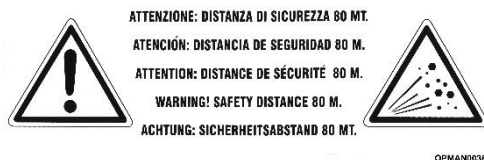
Plates with indications and particular warnings for maintenance and a correct use of some parts of the machine. The respect of these plates lengthens the duration and the efficiency of the Mower.



Check the oil level the first time the machine is used.



Indicates the correct functioning of the input PTO shaft.



Keep clear from the moving machine;
Keep at a safe distance.
Keep away from moving parts.



Lifting point

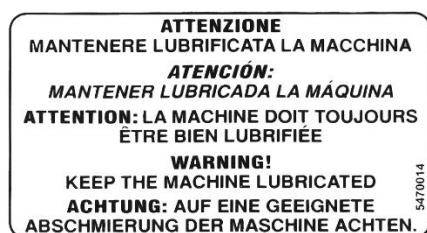
RECOMMENDED LUBRICANTS	
GEARBOX OIL GRADE	SAE. 90 EP
GREASE	WB2 (NLGI 2/3)

OPMAN00444

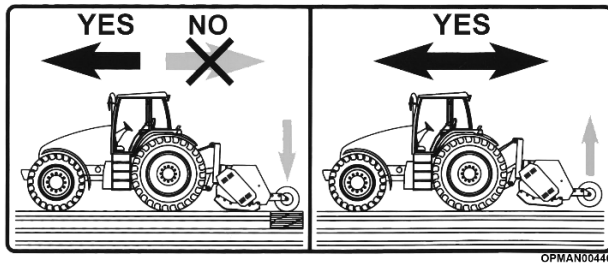
Lubrication

Ensure that the machine gearbox and connecting shaft is sufficiently filled with oil of the correct grade.

Ensure that all grease points are regularly greased to maintain correct operation and longevity.

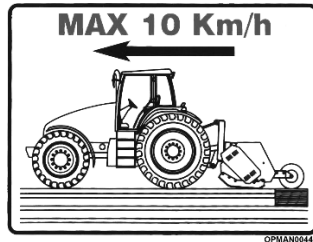


OPMAN00445



Correct speed and driving direction
Ensure that the machine is driven at no faster than 10 kmh and only driven in the forwards direction when operating.

Ensure that the machine is raised and stopped before requiring to reverse the machine.



PTO maximum operating speed.

Do not exceed the stated maximum operation speed as stated on the decal near the gearbox of the machine.

ATTENZIONE - Avviare lentamente per evitare dannose sollecitazioni agli organi di trasmissione.
ATTENTION - Démarrer lentement pour éviter des sollicitations dangereuses aux organes de transmission.
ATTENTION - Start slowly to prevent dangerous shock loads to transmission components.
ACHTUNG - Langsam anlaufen lassen, um Überlastung der Antriebsorgane zu vermeiden.
CUIDADO - Arrancar lentamente para evitar sobre esfuerzos a los órganos de transmisión.

OPMAN00445

Engage drive slowly.

Start and engage drive slowly in order to prevent shock loads to the machine transmission components.

ATTENZIONE: NON OPERARE CON IL COFANO ISPEZIONE APERTO
ATTENTION: NE PAS UTILISER AVEC LE CAPOT - INSPECTION OUVERTE
WARNING! DO NOT OPERATE WITH INSPECTION HOOD OPEN
ACHTUNG: BETREIBEN SIE NICHT MIT INSPEKTION HAUBE GEÖFFNET
ATENCIÓN: NO TRABAJAR CON EL CARTER DE INSPECCIÓN ABIERTO

OPMAN00450

Do not operate with the machine inspection hood open.

The opening inspection hood is for maintenance accessibility only and should be left open when the machine is in use.



Read the use and maintenance manual with care prior to starting up the machine.



Risk of cutting off feet.
Keep at a safe distance.
Do not remove protections before halting and disconnecting the machine.



Always disconnect the machine from the tractor prior to any maintenance and/or lubrication work.



Risk of cutting off hands.
Keep at a safe distance.
Do not remove protections before halting and disconnecting the machine.



Risk of falling.
It is prohibited to climb onto the machine.



Risk of entanglement
in the PTO shaft.
Keep away from
moving parts.



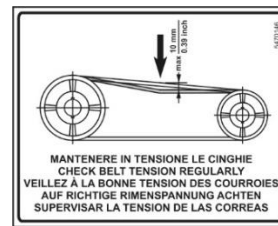
Risk of ejected objects.
Stay at a safe distance.



Risk of crushing.
Do not stand between
the machine and the
tractor.



Greasing point.



Use the protection mask

Use protection gloves

Use protection muffs

Use the protective overalls

Use protective footwear

Indicates maximum adjustment movement
(1cm = 5 Kg) of the belt, for correct
transmission.



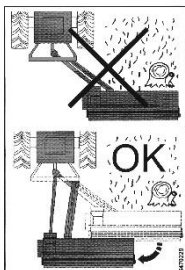
Operating, servicing and maintaining this
equipment can expose you to chemicals
which are known to the State of California to
cause cancer and birth defects or other
reproductive harm.



Slew round and fold down hazard

Ensure that no operator or bystander is within the working area of the machine
during operation.

Be aware of the movable working area abilities of the offset flail mower.

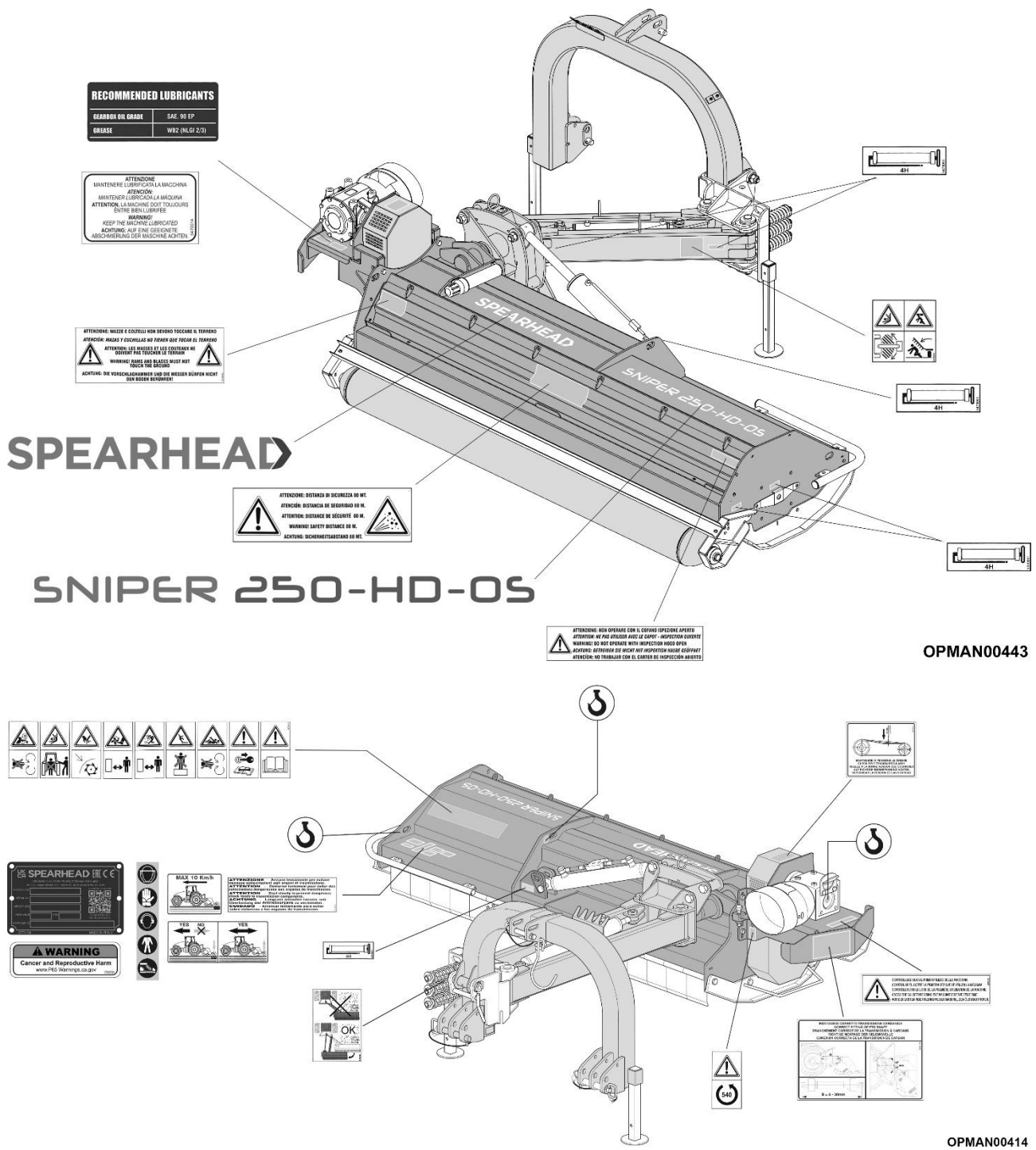


Adjust and move the offset flail mowers operating position to actively avoid
obstacles.

This will ensure safety to the operator and bystanders as well as the structural
integrity and wellbeing of the machine.

Figure 4

Figure 5 shows an indication of the precise points on the machine where labels are usually applied by the manufacturer.



(250-HD Offset model shown)

Figure 5

2.3.1 Proposition 65



Operating, servicing and maintaining this equipment can expose you to chemicals including gasoline, diesel fuel, lubricants, petroleum products, engine exhaust, carbon monoxide, and phthalates, which are known to the State of California to cause cancer and birth defects or other reproductive harm.

To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves and wash your hands frequently when servicing your vehicle. Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov.

This website, operated by California's Office of Environmental Health Hazard Assessment, provides information about these chemicals and how individuals may be exposed to them.

2.4 Clothing

In general, it is necessary to wear suitable clothing for the work to be carried out. In particular, as far as Mower 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 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

Below are the minimum provisions to be followed in order to reduce the risk of environmental impact connected to the use of the machine:

- If the Country where the machine is used foresees specific sound emission limits, it is best to adapt to the provisions in these standards, if necessary, being supplied with suitable protective equipment (earplugs, muffs, etc.).
- **It is mandatory** to respect current legislation of the Country where the Mower is used, related to use and disposal of lubricants and products used for machine cleaning and maintenance, observing the recommendations of the manufacturer of those products.
- If replacing worn parts or during demolition, one must follow anti-pollution laws foreseen in the country where the Mower is used.
- **It is prohibited** to pour products used for cleaning or polluting substances into the sewerage drain, on the ground, in watercourses, or into the environment.
- **It is mandatory** to collect products used for cleaning and polluting substances in appropriate containers, store them and deliver them to companies authorised for their disposal.

2.5.1 Disposal

If deciding not to use the Mower, it is best to take a few precautions in order to avoid the risk of environmental pollution. The various parts of the machine must be treated as if they were special waste. One must proceed by taking apart the equipment, grouping the various parts and components in similar parts (rubber, metal, plastic, etc.), providing for disposal of these parts separately, according to existing anti-pollution laws of the Country where the machine was used. Please note that, in general, **exhausted lubricating oil, rubber parts and scrap metals are special waste**.

2.5.2 Storage

If the machine is to be set aside for a long period, it is recommended to:

- Treat the Mower according to the instructions contained in the "5.2. Cleaning the Mower" paragraph;
- Check the machine and have any damaged parts replaced;
- Fully tighten all screws and bolts, in particular those which secure the flails;
- Perform a general thorough lubrication;
- Place the Mower in a dry area where it cannot be touched by persons not authorised to use it and rest it on struts of wood.
- Protect the entire machine with a tarpaulin.

If these operations are carried out properly, the user will find the Mower in perfect condition when it is required again.

If the Mower is to be dismantled, comply with the relative anti-pollution legislation of the Country of use.

It should not be forgotten that the Manufacturer is always available if you require any assistance or spare parts.

2.6 Safe Use

- **It is prohibited** to use the Mower in ways that are different from the indications contained in the paragraph "1.6. Intended use".
- **It is prohibited** to use or have the Mower used by anyone who has not read and completely understood the information contained in this manual.
- **It is prohibited** to use or have the Mower used by personnel that are not competent or properly trained or not in good health or physical condition.
- **It is forbidden** to drive the agricultural tractor attached to the Mower or have it driven by personnel without an appropriate driving licence.
- **It is forbidden** to approach or stop near the Mower when the machine is running.
- **It is forbidden** to stop between the agricultural tractor and the Mower (area taken up by the input PTO shaft) if the combustion engine is running.
- **It is forbidden** to abandon the driver's seat on the agricultural tractor with the combustion engine running when the Mower is running.
- **It is forbidden** to alter, tamper with or bypass the safety devices provided by the manufacturer.
- **It is forbidden** to operate when the labels indicating the warning signs are missing or damaged. Have them immediately replaced with other labels having the same meaning.
- **It is forbidden** to use the Mower when even one split pin, elastic pins or shims supplied with the machine is missing.
- **It is prohibited** to come close and/or touch moving parts during the work.
- **It is prohibited** to tamper with, remove, damage or exclude any part of the machine.
- **It is forbidden** to deposit items on the Mower which can harm persons or animals, or damage property should they fall.
- **It is forbidden** to abandon the Mower and leave it unattended. The machine and the work area should always be monitored.
- **It is forbidden** to transport persons or items on board the Mower while driving with the tractor.
- **It is mandatory** to check that all the safety devices of the Mower are intact and functional before using it.
- **It is mandatory** to check that the agricultural tractor on which the Mower is installed is of adequate power, weight and configuration, compatible with the model fitted.
- **It is mandatory** to disconnect the input PTO shaft from the PTO and set the control lever of the tractor hydraulic lifter in the blocked position when driving on the road with the Mower lifted.
- **It is mandatory** to use the type of input PTO shaft indicated by the manufacturer of the Mower.

- **It is mandatory** to set the control lever of the lifter in the blocked position before connecting or disconnecting the Mower from the three-point hitch of the tractor.
- **It is mandatory** to comply with highway regulations in force in the country where the Mower is used.
- **It is mandatory** to verify that the ground on which the tractor moves is level and sturdy, before using the machine.
- **It is mandatory** for the environment where the machine operates to have adequate lighting. Insufficient or excessive lighting may pose a risk to the operator.
- **It is mandatory** to familiarize yourself with the control devices and their functions prior to starting work;
- **It is mandatory** to make sure that the maximum number of revolutions of the PTO is set to 540 rpm before powering it.
- **It is mandatory** to make sure that the input PTO shaft is connected properly and is fitted with the security devices required before powering the PTO.
- **It is mandatory** to use suitable clothing. Strictly avoid long or loose clothing that could be caught in any way by moving parts. Wear suitable helmets, glasses, gloves, footwear, etc.
- **It is mandatory** to disconnect the input PTO shaft connecting the gearbox of the Mower to the tractor PTO before starting any maintenance.
- **It is mandatory** to lower the Mower attached to the lifter unit, switch the combustion engine off and remove the ignition key from the dashboard of the tractor before leaving the driver's seat and engaging the parking brake.
- **It is mandatory** for the interventions and adjustments to always be performed with the machine switched off and disconnected from the power.
- **It is mandatory** to stop the machine and inspect it if abnormal vibration is noted or have it inspected by personnel assigned by the manufacturer until the causes are identified and eliminated.
- **It is mandatory** to contact a dealer if the machine stops during operations or a component malfunction.
- **It is mandatory** to always verify, before starting up the Mower, that no persons and/or animals are within 50 metres in any direction from the machine.
- **It is mandatory**, if the agricultural tractor has no closed cabin, for the operator to use ear protectors and a dust mask if the working ground lifts a considerable amount of dust. Ensure that the tractor is fitted with a Rollover Protection Structure (ROPS).
- **It is mandatory** to periodically verify that the screws and bolts are tightened and secure, especially those that secure the flails.
- **It is mandatory** to use the types of lubricating oils indicated by the manufacturer.
- **It is mandatory** to periodically check the integrity and functionality of the safety devices.
- **It is mandatory** to comply with the laws in force in the country of installation on the use and disposal of products used for cleaning and performing maintenance on the machine, considering the recommendations of the manufacturer of the given products.
- **It is mandatory** for the Mower to be handled without being subjected to impact with other objects which could compromise the optimal functionality.
- **It is mandatory** for the Mower to be lifted adequately and with suitable lifting accessories and harness and according to the regulations in force in the country where these operations take place.
- **It is mandatory** for maintenance on the Mower to only be performed by skilled and specialized personnel, in strict compliance with the instructions in this manual, and any worn or damaged parts should be replaced.
- **It is mandatory** to always use original spare parts when carrying out repairs and maintenance.
- **It is mandatory** to set the Mower in a safe place which is protected from the elements, when the work is completed.

The Mower has been designed and built in accordance with current safety regulations. Special maintenance (repairs) must only be performed by qualified personnel and original spare parts must be used.

2.7 Safe Maintenance

In order to guarantee safe maintenance of the Mower it is necessary to respect the following provisions:

- **It is prohibited** to remove or tamper with the safety devices.
- **Periodically check** safety device integrity and operation.
- **Periodically check** screws and bolts tightness.
- **It is mandatory** to periodically verify the condition of the hoses. They must not be cut or have abrasions, otherwise immediately replace them with other hoses having the same characteristics.
- **It is mandatory** to comply with the recommended oils.
- **It is mandatory** to switch the tractor engine off and always disconnect the input PTO shaft before cleaning or performing maintenance on the Mower.
- **It is mandatory** to strictly perform maintenance on the Mower according to the instructions in this manual and replace the damaged or worn parts with original spare parts only.
- **It is mandatory** for maintenance on the Mower to only be performed by skilled and specialized personnel, in strict compliance with the instructions in this manual.
- **It is mandatory** to always use original spare parts when performing repairs and maintenance on the Mower. Using non-original parts immediately renders the warranty null and void and can compromise the durability and reliability of the machine.
- **It is mandatory** for parts or components of the Mower to be lifted adequately and with suitable lifting accessories and harness and according to the regulations in force in the country where these operations take place.
- **It is forbidden** to perform welding, flame-cutting or with a tool or holes on the structure of the Mower.
- **The dangers** signalled on the machine by way of pictograms (labels) of suitable dimensions, applied on the Mower in easy to see places.
- These signals give the proper indications in an essential manner in order to avoid danger and prevent the risk of damage or injury. These signs must always be kept clean and immediately replaced when removed, even partially, or damaged: **it is prohibited** to operate the Mower when even one of these signs is missing from the spot where it was installed by the Manufacturer.
- **It is mandatory** to save and keep this manual for the entire life of the Mower.

3 Installing The Mower

Before starting to use the Mower, **it is mandatory** to read and perfectly understand the instructions contained below.



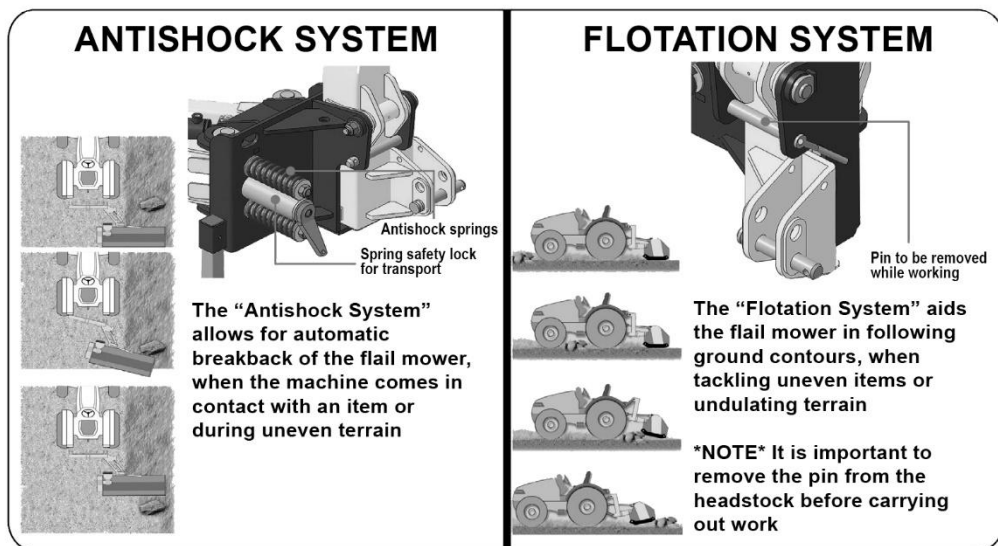
WARNING! Read the instructions contained in the chapter, "2. General Safety And Accident Prevention Standards".

3.1 Delivery

The Mower is supplied fully assembled and protected with a "heat-shrink" plastic cover. Handles protrude from the cover for lifting and vertical handling of the mower with straps or cables able to withstand the machine's weight, as illustrated in Figure 6.

When transporting the Mower, **it is mandatory** to insert the pin (P) to lock the parallel arms shown in Figure 6.

To transport by carriage, make sure that the Mower is securely anchored to the floor with suitable standard ropes or straps, in accordance with the requirements set out in the "4.5. After Use" paragraph.



OPMAN00415



WARNING! Before operating the machine, make sure that you have removed the pin (P).

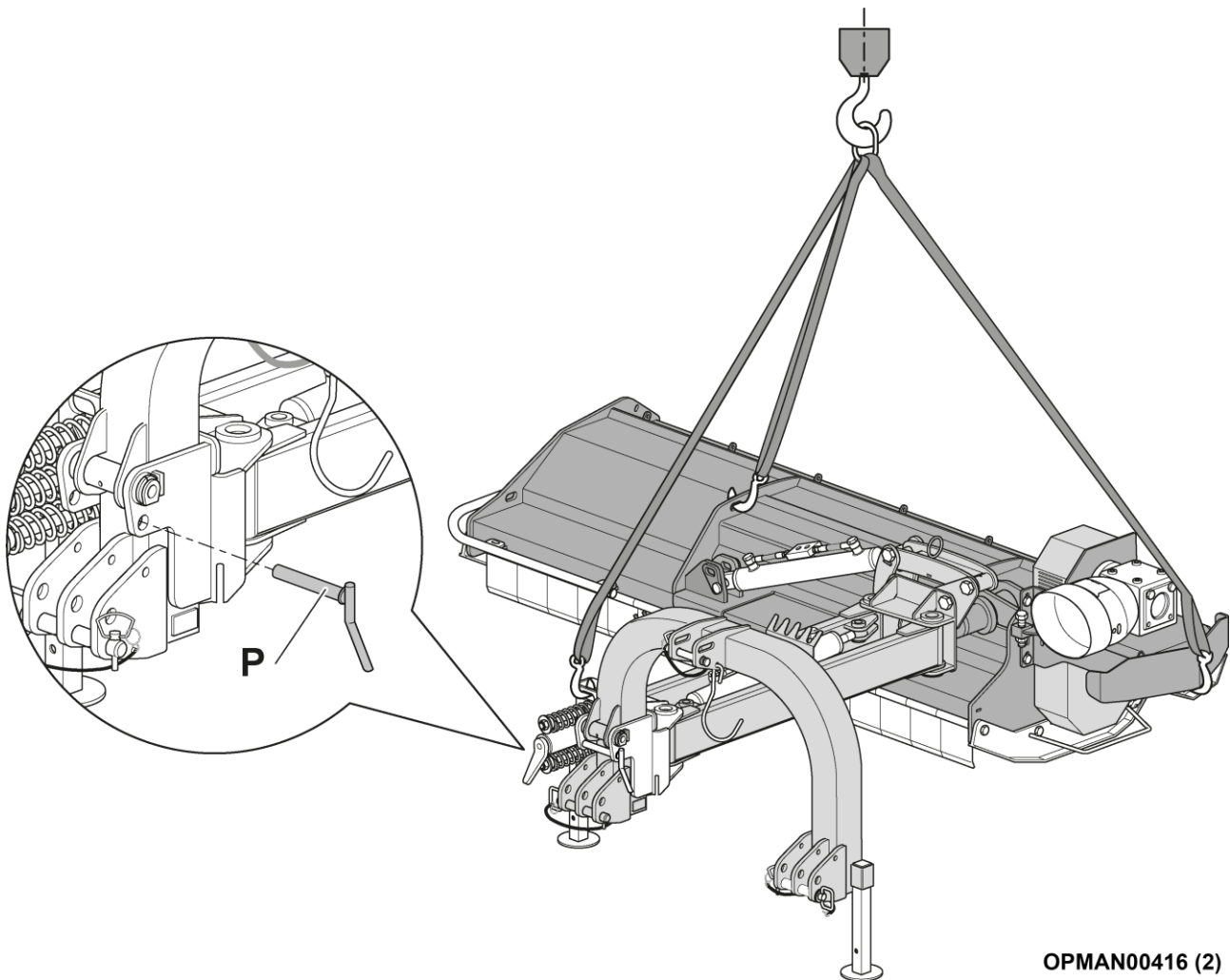


Figure 6

OPMAN00416 (2)



WARNING! The machine must be lifted with maximum care and by using lifting devices suitable for the weight and size of the same.



WARNING! Due to the danger of this operation, it must be performed by expert and responsible personnel. For the lifting device to be used **it is mandatory** to comply with the safety regulations prescribed by the laws in force in the country where the machine is used. Do not touch the Mower and do not stop within the operating range of the crane.

After transportation, remove the protection film and check that the machine was not damaged in any way. Spearhead cannot be held responsible for any damage caused by handling carried out any differently from that described in the manual.

3.2 First Use



DANGER! Connecting the Mower to the agricultural tractor is a very dangerous phase. Ensure you carry out the entire operation in strict compliance with the instructions.

The Mower features a gearbox with a 1" 3/8 spline power take-off that can be adapted to any agricultural tractor PTO with an input PTO shaft. On first installation simply remove the machine from its packaging, remove the pin (P) which locks the parallel arms (Figure 6) and proceed to the proper preparation of the machine.

The installation, adjustment and testing of the Mower involve hazardous operations. Carefully read all the instructions described in this manual. If in doubt, contact the Manufacturer directly.

In any case, before commissioning the Mower, immediately after transport, check that the supply is intact and complete. The Mower can be installed and subsequently removed from the agricultural tractor according to the requirements of the user.



DANGER! Spearhead cannot be held liable for damage to persons, animals or property, caused by noncompliance with the safety and accident prevention regulations or operations which do not conform to the information provided in the user and installation instructions.

3.2.1 Prior To Installation

Before installing the Mower, it is advisable to check the suitability, good condition and adjustment of the agricultural tractor on which it will be installed:

- Begin by first checking the power in kW or hp and the minimum mass required of the agricultural tractor. They must match the minimum characteristics stipulated by the Manufacturer of the Mower, which are indicated in this manual in the "1.4. Technical Data" paragraph;
- Move the tractor to the place where the Mower was deposited after being transported and stop it in a safe and practical position for assembly to be performed on level ground;
- Lift the Mower with a lifting device of adequate capacity and move the machine near the rear part of the tractor, in line with the three-point hitch support. Move the tractor in reverse to attach the equipment to it;



WARNING! Due to the danger of this operation, it must be performed by expert and responsible personnel. Do not touch the Mower and do not stop within the operating range of the lifting device.

3.2.2 Application To The Tractor



WARNING! Clean and clear the installation area from any obstruction before starting to work. The area must be specifically closed off and personnel not assigned to the works must be made to move away. The available means must be verified to be intact and suitable. The operator must also tighten all the bolts and fittings properly, using suitable tools.



DANGER! All the following assembly and installation operations must be carried out with the tractor engine switched off.

Proceed as follows for the coupling (see Figure 7):

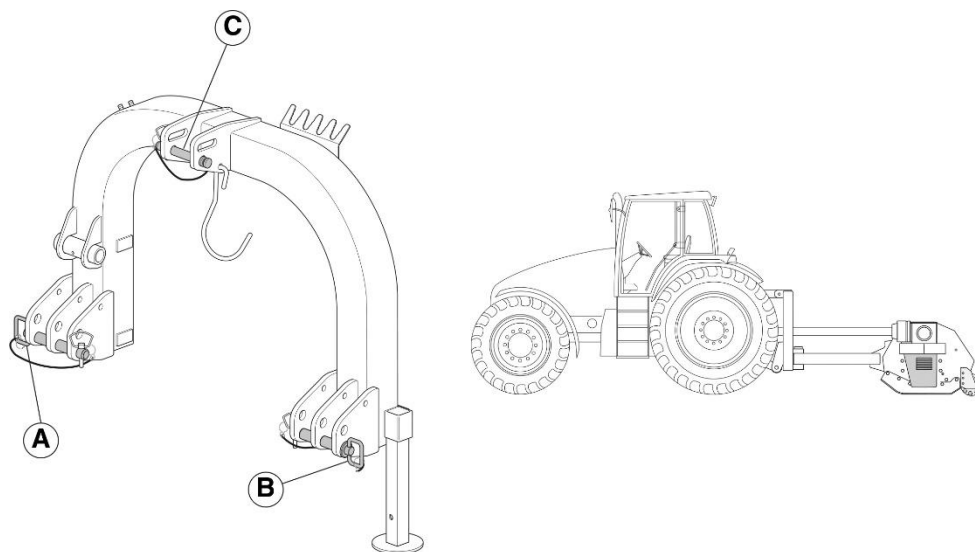


Figure 7

OPMAN00417

- 3.2.2.1 Use appropriate protective gloves to move the tractor back until the tractor lower link arms are inside the plates (A) and (B). Insert the pin into the pre-set hole and secure it with the split pins.
- 3.2.2.2 Switch the tractor off and engage the parking brake.
- 3.2.2.3 Lock the lower link arms on the tractor with the appropriate chains and parallel tighteners: this precaution must take place in order to avoid any sideways movement of the Mower.
- 3.2.2.4 Engage the Input PTO shaft and make sure that it is perfectly locked on the power take-off.
- 3.2.2.5 Verify that the protection rotates freely and secure it with the appropriate chain. Remove the support from the Input PTO shaft.
- 3.2.2.6 Connect the top link (C), securing it with the appropriate pins and split pins.
- 3.2.2.7 Sniper HD Offset headstocks feature two places in which the top link pin can be fitted.
 - A fixed hole (ref Figure 7 (1)); which should be used for transport purposes.
 - A slotted hole (ref Figure 7 (2)); which should be used for working purposes.

The fixed hole (ref Figure 7 (1)) should be used during transport purposes, when the machine is out of work, folded up and is required to be lifted off the ground. The fixed hole ensures the machine remains as stationary as possible and will not move when its carried by the tractor.

The slotted hole (ref Figure 7 (2)) should be used when the machine is operating at work. The slotted hole allows the machine to follow ground contours more effectively, giving better operation and final finish of the cut material.

- 3.2.2.8 Use the tie-rod to correctly adjust the pitch angle of the front of the machine, making sure that the upper surface of the Mower is parallel to the ground. This is very important to obtain parallelism between the mower power take-off shaft axle and the tractor power take-off.

Operating in these conditions means limiting the stresses on the power take-off and life of the Input PTO shaft and the Mower itself.

The correct position of the tractor/Mower unit is such when the Mower is at a distance from the tractor so that the input PTO shaft does not extend beyond 10-15 cm from the maximum closing position.

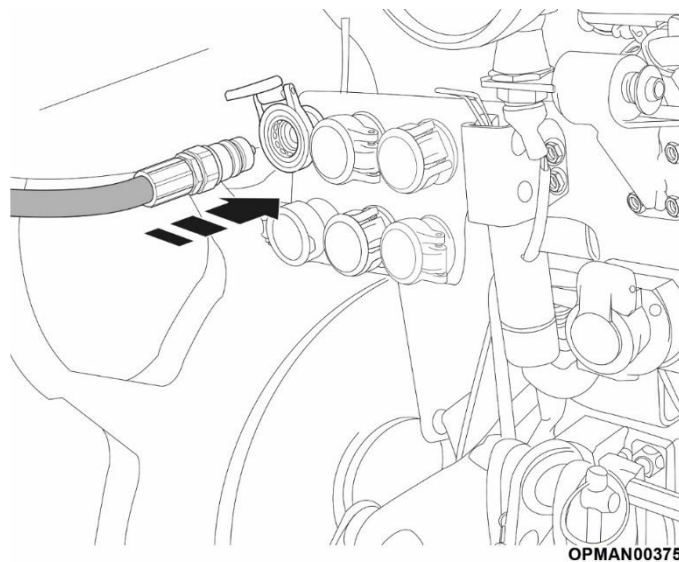


Figure 8

- 3.2.2.9 Connect the 4 hoses of the hydraulic system of the Mower to the appropriate services on the tractor (Figure 8) considering that:
 - 2 hoses control the hydraulic ram controlling the offset of the Mower;
 - 2 hoses control the hydraulic ram controlling angling of the Mower;
- 3.2.2.10 Engage the PTO and accelerate up to a minimum of 400 rpm. Then test lift the Mower to verify proper operation.

3.2.3 Antishock System

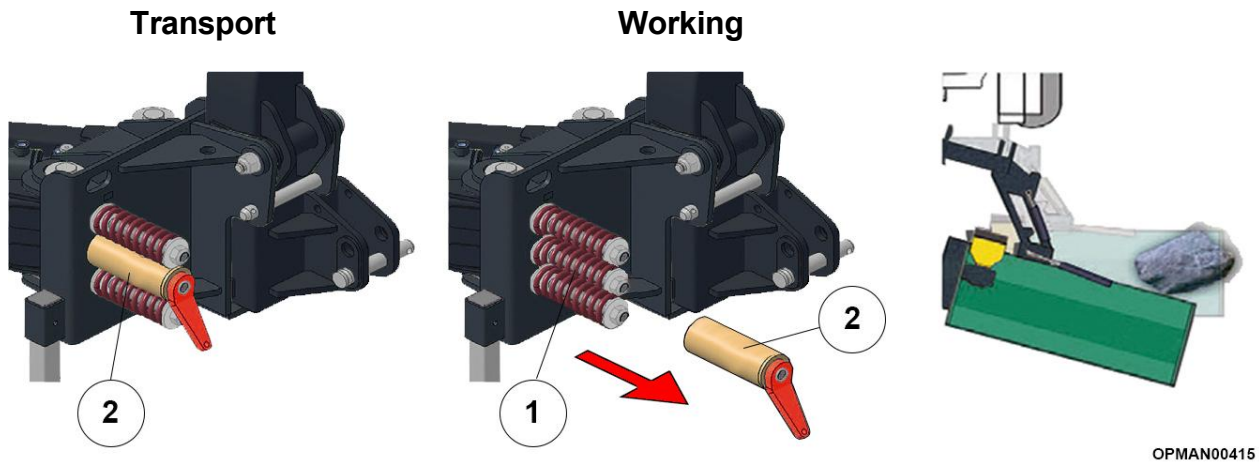


Figure 9

Sniper HD Offset machines feature three springs fitted to the headstock (Figure 9(1)) to allow the machine to automatically breakback if the machine comes into contact with an item or if it needs to follow uneven terrain when in work.

These springs should be fitted to the machine at all times as shown in Figure 9.

The springs should be compressed to a specific length to allow the machine to breakback correctly against an obstacle and at the correct time. The settings for the length of the springs are given in Section 5.2.

The machines also feature a transport spring safety lock sleeve (Figure 9 (2)) which should be fitted during transport to ensure the machine stays as stationary as possible when folded. This safety lock should be slid over the centre spring and then secured in position through use of the handle.

This sleeve should be removed before work to ensure that the machine effectively breaks back.

3.2.4 Flotation Pin

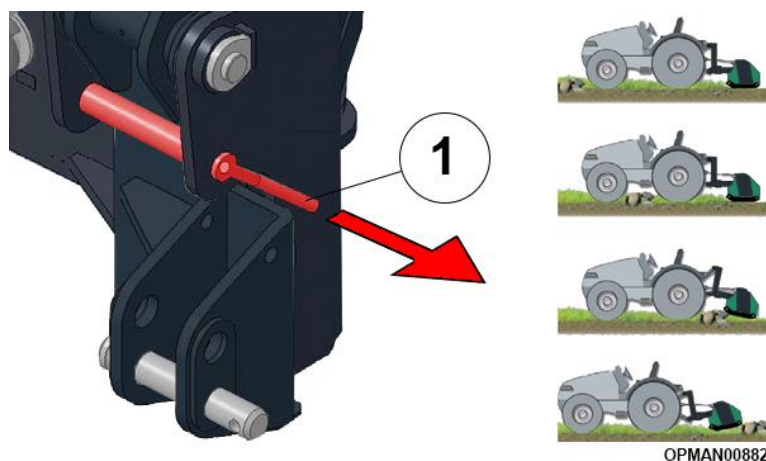


Figure 10

Sniper HD Offset machines feature a removable pin near the mounting point of the parallel arms to the headstock (Figure 10 (1)). It is important to remove this pin to allow the machine to float correctly and allow the machine to be able to follow ground contours more effectively, giving better operation and final finish of the cut material.

It is important to reinstate this pin prior to transporting the machine out of use to ensure the machine stays as stationary as possible when folded.

3.2.5 Input PTO Shaft

It is mandatory to only use the input PTO shaft supplied as standard by Spearhead. The Company assumes no liability if a input PTO other than the one supplied is used.



DANGER! An input PTO shaft applied to a tractor is a mechanical part, which, when operating, can be extremely dangerous for those using it. Therefore, you must be extremely careful regarding operations that involve these mechanical parts.



CAUTION! Before starting the power take-off, ensure that the rotation speed is the same as that required for the Mower (540 rpm).



WARNING! Spearhead declines any and all liability for damages caused by the 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.



CAUTION! It is forbidden to operate with the input PTO shaft worn or damaged. Before starting to work, replace the input PTO shaft.

For any spare parts only contact the Authorised Centres.

The Mower is fitted with a free wheel in the gearbox and can also be applied to a crawler tractor or in any case with no double clutch, without the danger that the inertia of the rotor prevents stopping the Mower/tractor assembly.

4 Usage Instructions

4.1 Before Use

Prior to starting up the Mower, carry out the following operations;

- Check that all the screws and nuts are fastened, especially those that secure the flails;
- Verify that the hydraulic hoses are in good working order;
- Check that the input PTO shaft is inserted correctly between the gearbox and the tractor PTO and also check the operation of the hydraulic services.
- Move the position of the adjustable top link from the fixed hole to the slotted hole before beginning work.



WARNING! Before operating the Mower, check the efficiency of the power systems and familiarize yourself with the controls.

During transport and every time, the Mower must be lifted with the tractor it is fastened to, the lifting device should be adjusted so that the machine is lifted from the ground by about 35 cm (see Figure 11).

Furthermore, verify that all blocking devices are activated so that the Mower is absolutely safe.

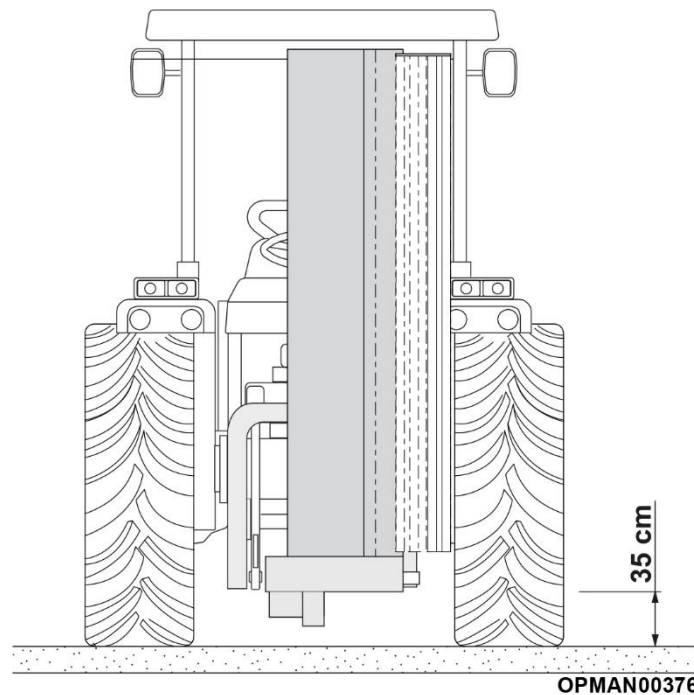


Figure 11

4.2 Control System

Angling and offsetting the cowl and starting the rotor of the flail mower are obtained by using the control levers installed on the agricultural tractor, which directly control the 2 hydraulic cylinders through a hydraulic pump driven by the tractor motor. Releasing one of the control levers immediately stops Mower movement.

The rotation of the mowing rotor shaft instead is driven indirectly by the input PTO shaft connected to the PTO of the tractor through a transmission system with pulleys rotated by toothed belts.

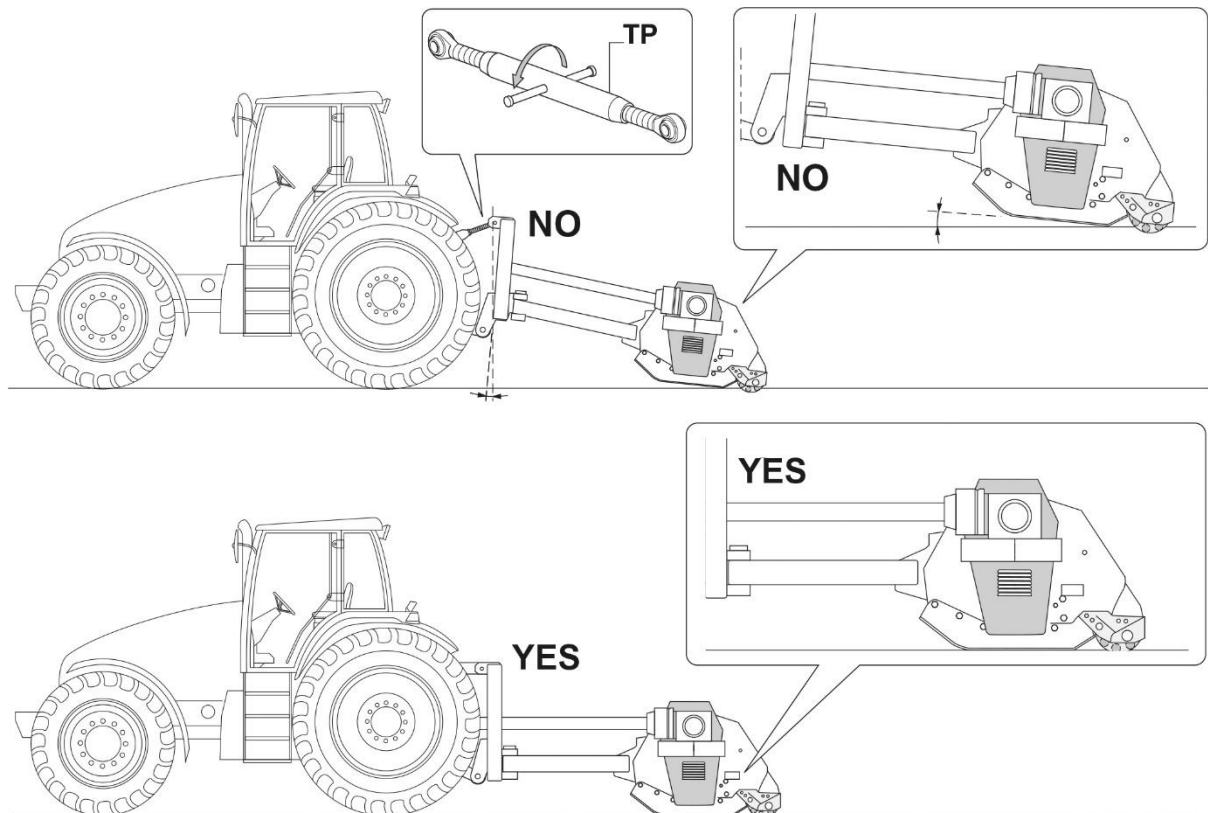
4.3 Machine Settings

A number of adjustments can be made on the Mower to help the operator in the various working conditions that may arise.

4.3.1 Adjustment Of The Skids And Roller

Adjust the position of the skids and the rear roller so that the flails do not come out of the plane made by the two skids. In this way, even if there are irregularities in the ground, the flails will not penetrate the ground itself. It is important to check that the Mower is perfectly parallel to the ground in order to obtain perfect operation.

The adjustment must be carried out using the adjustable top link of the tractor (TP) (Figure 12).



OPMAN00418

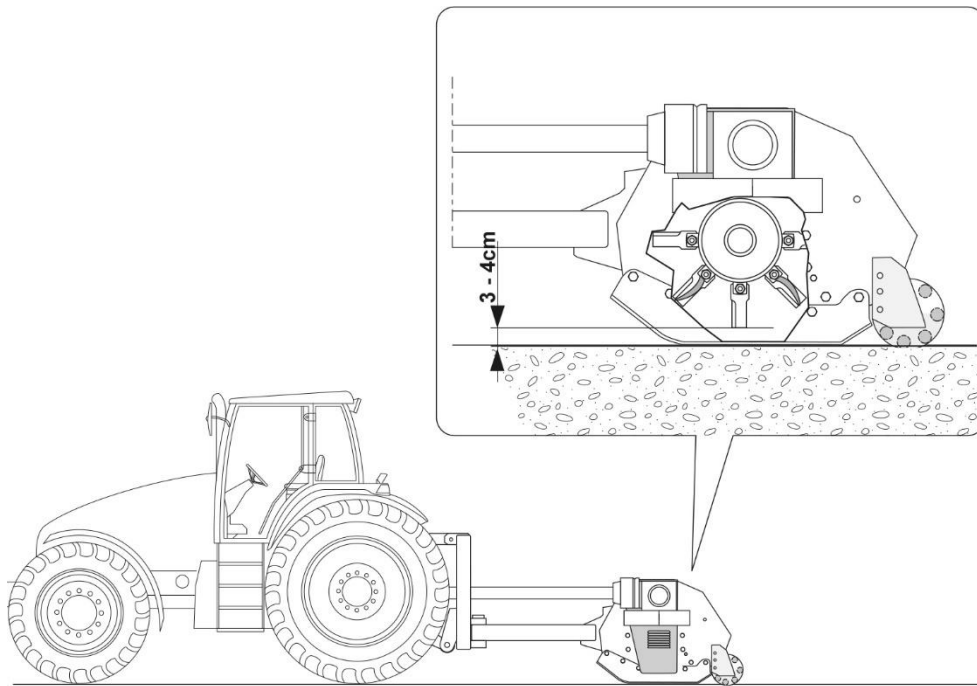
Figure 12

4.3.2 Adjustment Of Working Height

To adjust the working height, raise or lower the skids and the rear roller until obtaining the desire position.

To correctly adjust the working height of the Mower, it is necessary:

- To gradually and completely lower the Mower, with the tractor off and the emergency brake on, using the lifter, to ground level;
- Adjust the working height so that the flails are at about 3 - 4 cm from the ground (Figure 13).



OPMAN00378

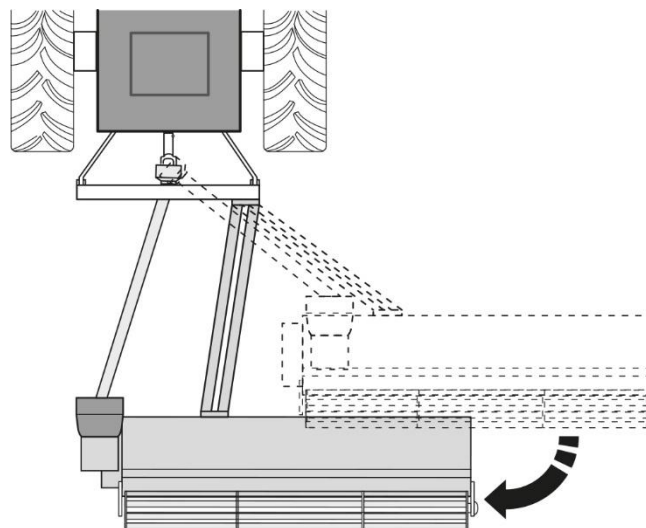
Figure 13

4.3.3 Adjustment Of Mower Working Position

By using the hydraulic controls whilst sat in tractor's seat it is possible to control the offset movement of the Mower (see Figure 14) and the working angle (see Figure 1) through two hydraulic rams, leaving the three-point hitch fixed.

Offsetting the flail mower must be executed with the Mower slightly lifted up from the ground.

The cutting device tilt (see Figure 15) can be useful for particular works, such as in proximity of ditches or crops that require side and tilted movement of the Mower. By using the offsetting mechanism shown in Figure 14 it is possible to shift the positioning of the Mower both upwards or downwards to suit the different embankment slopes while keeping 145° total rotation.



OPMAN00379

Figure 14

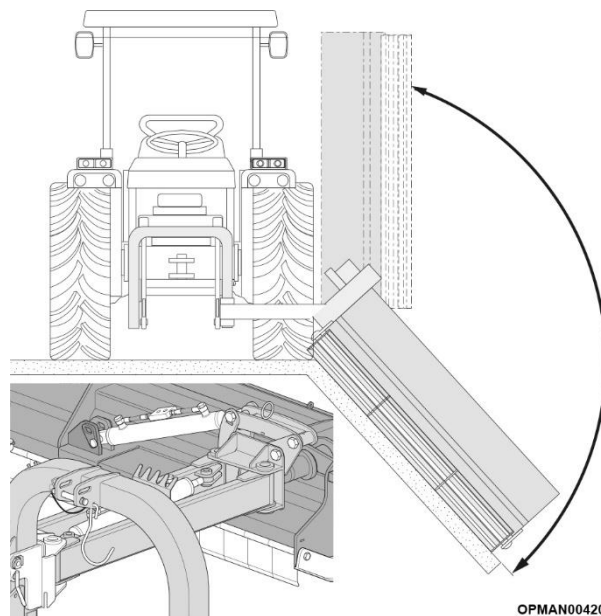


Figure 15

4.4 Using The Mower

After having familiarized yourself well with the controls, worn the PPE (personal protective equipment) required, set the machine in the desired working position, and having connected the gearbox and secured it properly to the tractor PTO by means of the input PTO shaft and hydraulic hoses to the tractor's hydraulic services, start the tractor engine, disengage the parking brake, and engage the PTO while maintaining the engine at low rpm.

Before starting work, make sure that there are no exposed persons and/or animals near the machine. Otherwise, have them move away.

NOTE: CHECK THE INSPECTION HOOD IS PROPERLY CLOSED.

On start-up, move slowly with the tractor, gradually and slowly lower the Mower until it reaches the ground. Then, the engine can be brought to the work speed.

It is recommended not to press the accelerator pedal rapidly when the tractor is stationary, and the PTO is engaged, and the Mower is not running. This can cause damage to the machine and the tractor.

The processed material is shredded correctly by maintaining the tractor at a low forward speed and the rotor rotating at a constant speed.

N.B: Spearhead recommends that you always use a tractor equipped with a closed cab.



WARNING! The speed of the tractor with the mower working must never exceed 5km/h in order to avoid breakage or damage.



DANGER! During work, stones or other objects found in the terrain can be lifted and projected by the rotating flails. Constantly check that there are no persons or animals within the operating range of the Mower (Figure 16).



WARNING! Spearhead declines any and all liability for damages caused by the 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.



WARNING! Avoid letting the Mower rotate idly. During work, avoid making turns with the Mower lowered and do not work in reverse. **It is mandatory** to always lift the Mower when changing direction or reversing the machine and tractor.

During transportation and any time when it becomes necessary to lift the Mower, it is necessary to adjust the tractor linkage so that the Mower itself is lifted more than about 30-35cm from the ground.

Avoid driving on public roads when the Mower is dirty with earth, grass or at any time when it produces dirt or obstructs the traffic on the roads.

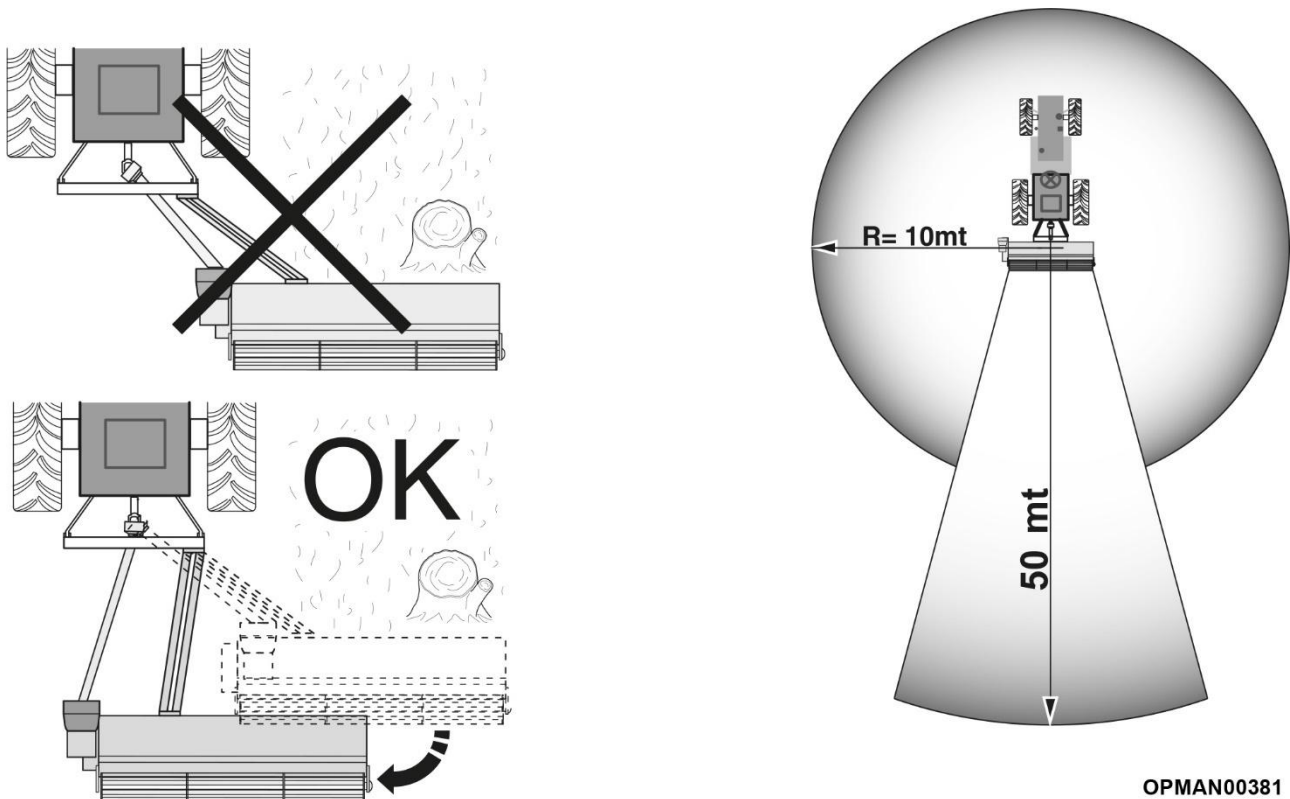


Figure 16

OPMAN00381

4.5 After Use

A few guidelines must be complied with when the work is complete, in order to make sure the Mower is stable when released from the tractor:

- Move to the storage area of the Mower, making sure that the supporting surface is flat and free from obstructing material.
- Place the Mower on the ground by lowering the linkages of the tractor lifter.
- Raise the rear roller so that the Mower rests on the skids acting on the three-point hitch.
- Switch the tractor off and engage the parking brake.
- Before leaving the driver's seat of the tractor remove the ignition key from the dashboard.
- Disconnect the input PTO shaft that connects the gearbox with the tractor PTO.
- Release the top link from the three-point hitch by releasing the appropriate pins and split pins.
- Release the chains and tensioners of the tractor lower linkages.
- Release the pins from the lower linkages by releasing the relevant split pins.
- Climb into the driver's seat of the tractor, start up and move the tractor away from the Mower.
- Use the specific supporting feet in the parking position (Figure 17).

Store the equipment, preferably in a covered area, on a suitable and flat surface. Follow the instructions in the "2.5.2. Storage" paragraph of this manual.

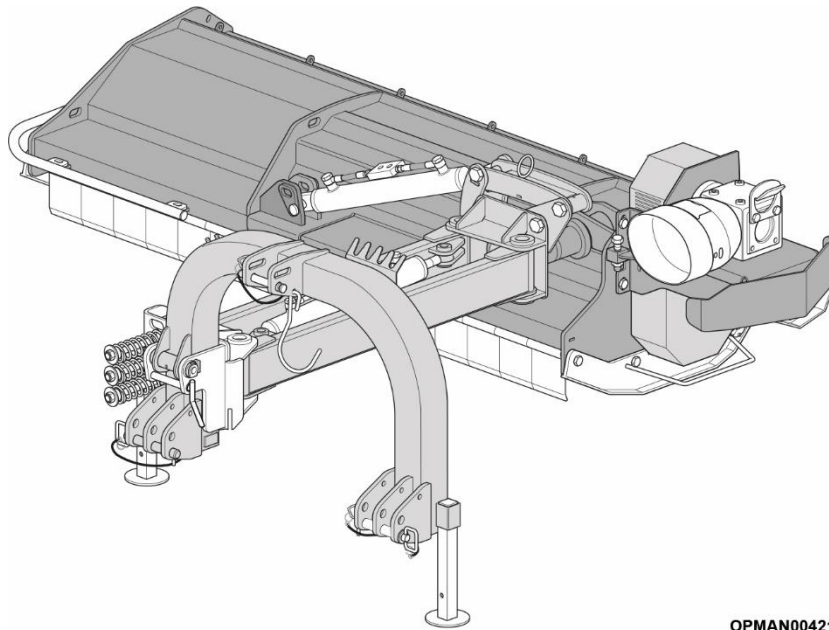


Figure 17

OPMAN00421

4.6 Safety Devices

There are safety devices in the Mower to safeguard the operator.



WARNING! The safety devices must not be tampered or excluded. They should always be kept in perfect working order.

The following are installed:

- The **safety release valve on each of the hydraulic rams** makes it possible to relieve the oil when circuit pressure exceeds the valve calibration value established by the manufacturer.
- **Fixed input PTO protection** covers both crosses and prevents hands from being introduced into the rotating area of the input PTO shaft.
- **Fixed belt protection** covers both belts and prevents hands from being introduced into the lateral transmission area.
- A **safety protection** consisting of a number of chains placed in the lower part of the machine prevents the soil and/or fragments of plants from being projected outwards.
- The **warning pictograms of the residual risk** essentially indicate an existing danger, a prohibition or requirements that are to be met for the operator's safety and for the Mower to operate correctly and remain intact.

4.7 Machine Transport Procedure



WARNING! Proceed at a moderate speed, as the mass of the tractor with flail mower lifted changes the stability of the tractor-machine unit, influencing the steering and braking capacity.

It is important to remember that the front axle should have sufficient weight with a load equal to at least 20% of the weight of the agricultural tractor. Check the overall weight and stability of the tractor using the formula indicated below and apply the appropriate weights if necessary.

Influence of the weight of the flail mower	less than or equal	Influence of the weight of the tractor
$M \times (S + E)$	$\leq$	$0.2 \times T \times i \times Z \times (D + I)$

where:

- i** tractor wheelbase
- D** distance of the front axle from the front ballast
- S** distance between the centre of the rear axle and the centre of the lower link arms of the tractor
- E** distance of the centre of the lower link arms of the tractor from the centre of gravity of the flail mower (750mm)
- T** weight of the tractor + 75kg (operator)
- Z** weight of the ballast
- M** weight of the flail mower, see "1.4. Technical Data" paragraph

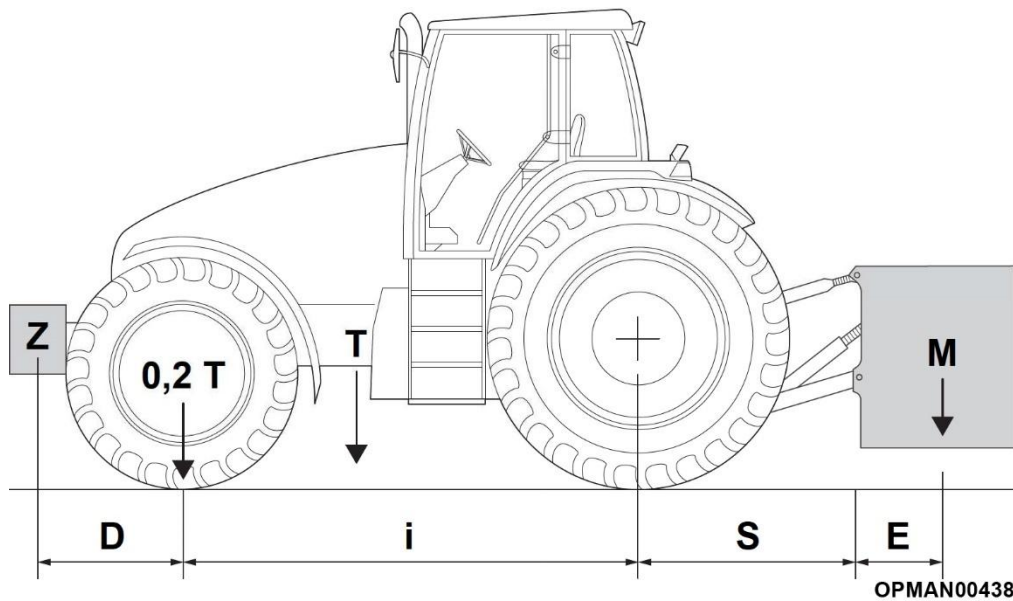


Figure 18

If the machine is combined with an agricultural tractor registered and approved before 6th May 1997, it is also necessary check the compliance with the following relation:

$$M < 0.3 \times T$$

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5 Maintenance

Routine maintenance operations are listed below. More extensive maintenance operations (re-pairs of parts or components) can be carried out by specialised personnel authorised by the manufacturer.



WARNING! The schedule is for information purposes only and depends on normal operation conditions. Conditions can in fact change depending on the service, the environment and on frequency of use. If conditions are particularly awkward, the frequency of maintenance operations should be amended accordingly.



WARNING! It is mandatory to make sure that the input PTO shaft connecting the gearbox of the Mower is disconnected from the agricultural tractor PTO before starting any maintenance.



WARNING! After maintenance, always restore any safety devices that may have been removed, so that they are in place before new work is started.

It is recommended to always use oil of the same type and quality as used previously when refilling or changing the oil. Greasing points should be cleaned carefully before lubrication, to prevent mud, dust or foreign bodies from mixing with the lubricant.

- **It is mandatory** that any repair and/or maintenance intervention be carried out by an operator with suitable physical and intellectual requirements.
- **It is mandatory** for routine maintenance operations to be carried out by a technician specialised in mechanics and hydraulics.
- **It is mandatory** to verify that during maintenance or repair operations; unauthorised personnel are kept away from the Mower.
- **It is prohibited** to deactivate protection and safety devices. When it becomes necessary to deactivate these devices in order to carry out more extensive maintenance, the operation must only be completed for more extensive maintenance and only by a maintenance mechanic, who will guarantee operator safety and avoid any damage to the machine, as well as restoring the effectiveness of the same devices at the end of maintenance operations.
- **It is mandatory** to switch the engine of the agricultural tractor which the Mower is connected to off before performing any maintenance or mechanical setting and disconnect the input PTO shaft.
- **It is recommended** to perform all maintenance that is not covered in this manual in an authorised service centre.
- Before restarting the Mower after lubrication and/or maintenance, **it is mandatory** to wait for the authorization of the mechanical maintenance technician who must verify that:
 - the works have been completed;
 - the Mower works perfectly;
 - the safety devices are in their correct place and fully functional;
 - no other operations are being performed on the Mower.

5.1 Periodic Maintenance

In order to guarantee proper operation of the Mower and improved operator safety, it is necessary to periodically intervene with controls and maintenance operations listed in the table shown below.

	Upon The First Use	The First 8 Work Hours	The First 50 Work Hours	Every 8 Work Hours	Every 50 Work Hours	Every 400 Work Hours
General check	X	X				
Tightening of screws and bolts	X	X		X		
Checking for wear and tear on flails and their locking screws	X			X	X	
Greasing yokes and Input PTO shaft	X	X			X	
Greasing rotation points	X			X		
Verify gearbox oil level	X				X	
Complete change of gearbox oil			X			X
Check transmission belt tension	X			X		

Table 4



WARNING! The machine must be checked by an authorised concessionary if any of its parts are worn or in poor condition.



WARNING! Replace the hydraulic hoses each time they are damaged or, in any case, before the sixth year. The used hydraulic oil must be properly collected and must not be dispersed into the environment since, according to the laws in force, it is classified as dangerous waste and for this reason it must be given to the proper collecting centres. Please, refer directly to the closest company for the collection of the used oils.

5.1.1 Maintenance On The Flails



WARNING! Spearhead is not liable for damage caused by vibrations generated by rotor shafts which have not been balanced after the flails have been replaced. Any requests for replacement under warranty or reimbursement for damage caused due to the rotors malfunctioning will not be accepted.

The flails with which the mower is equipped are suitable for working on grounds of normal condition. **It is mandatory** to check their integrity and the degree of wear every day. When faults or deformation occur in the flails during work, **it is mandatory** to replace them immediately. **Replacing a single flail is generally not recommended.** This can only be done when all other flails are in excellent condition and in any case, in order not to compromise the proper operation of the rotor, **it is mandatory** to also replace the opposite flail so as not to cause an imbalance in the rotor. **It is recommended** to always replace all the flails and not just the damaged ones, in order to guarantee proper operation.

After changing the flails, **it is mandatory** to subject the rotor to electronic balancing to guarantee the Mower works properly, free from vibrations that can cause serious damage to the machine.

To replace worn or broken flails it is necessary to:

- position the Mower and tractor on flat ground;
- raise the Mower with the linkages to the maximum height possible;
- place adequate support stands under the Mower on both sides for the machine to be perfectly stable;
- stop the tractor and put on the emergency brake;
- be equipped with adequate spanners and proceed with the replacement of the flails: forcibly tighten the securing bolts;
- before installation, weigh the individual flails as differences in weight are inevitable;
- select pairs of flails that have the same weight and mount them on the rotor in opposite diametrical positions.

The quality, integrity of the Mower and its safety depend on the care dedicated to the flails, which must be replaced immediately if damaged. Normal wear is exceeded and enhanced when working on sandy terrain or if

the Mower is too low and therefore, impact with obstacles occurs more often and distortion or cracks can be caused to the flails.

Damage to the flails will inevitably deteriorate the quality of work and increase vibration, possibly damage the Mower and partially or totally damage the flails resulting in metal fragments being dangerously projected at high speed into the area where the machine operates. When replacing the flails, **it is mandatory** to check that the seat of the flail bolt is not ovalized and its size is not more than 2 mm more than the original diameter.

For worn flails and bolts (see Figure 19):

- The length of the flail must not be less than the size indicated in the figure.
- The securing of the bolt is carried out with nuts: the nuts must be changed every time a flail is replaced; the tightening torque is 250 Nm.
- The special bolts must be replaced to fasten the flails if visibly damaged, bent or ovalized to the limit (see Figure 19).

When finished, remove the support stands, start up the tractor, lower the Mower and turn off the tractor.



CAUTION! Only use original spare parts.

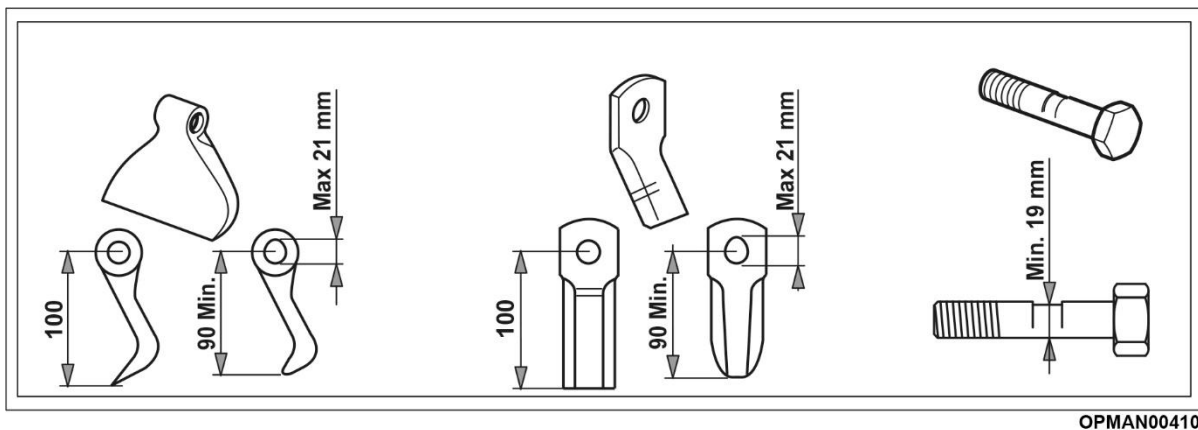


Figure 19

5.1.2 Belt Maintenance

The driving force is transmitted to the rotor shaft of the Mower by belts with adjustable tension. Periodically, or if the belts malfunction or slip, check the tension of the transmission belts from the appropriate slit and, if necessary, replace them.

With reference to Figure 20, operations to be carried out are the following:

- Remove the nuts that secure the protective guards (A) and (B);
- Loosen the bolts that secure the gearbox mount (C);
- Adjust the length of the belt tension screw (D) to adjust the belts tension.

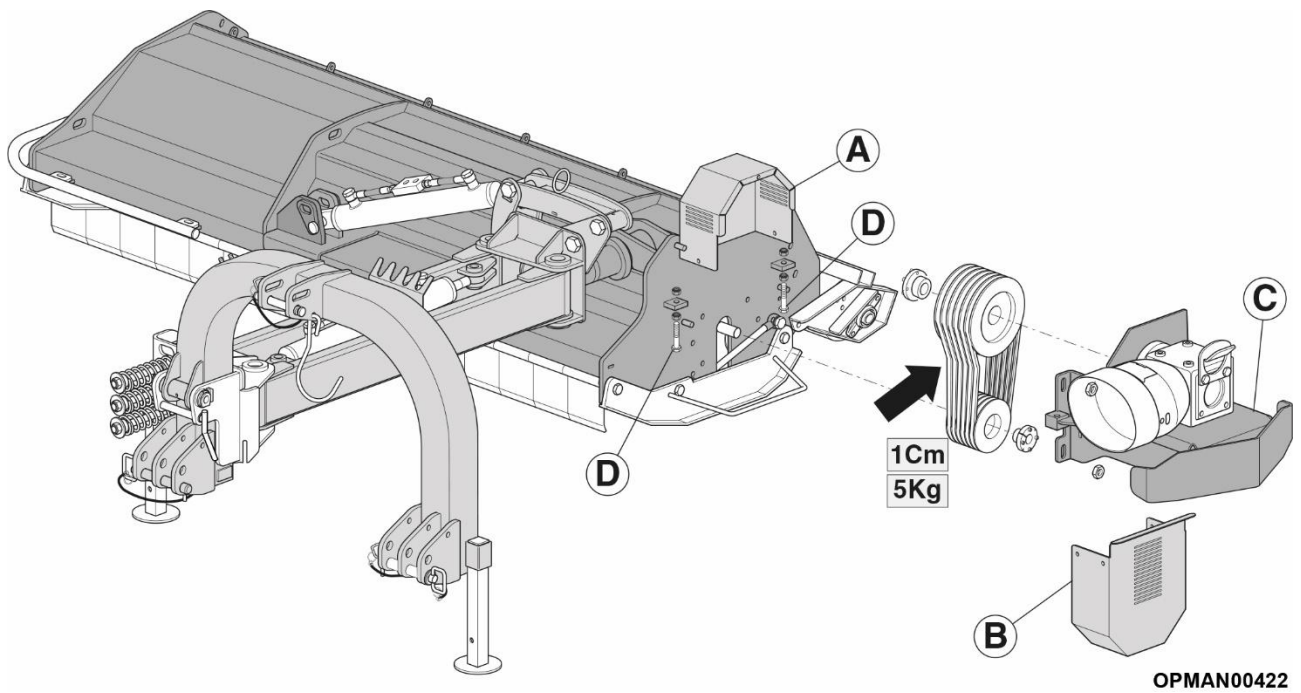
It is advisable to be equipped with a metal ruler of adequate length and, placing it on the edge of the two pulleys, it must touch all four edges of the pulleys themselves.

Press on the belts, in the central area between the two pulleys, with a force of **5kg**: the force must cause a deformation on the individual belt of **1cm**.

At this point:

- Tighten the bolts that secure the gearbox mount;
- Reassemble the previously removed belt guards.

The belts are stretched when working over time: when replacing a worn or broken belt, for an equal distribution of forces, **it is mandatory** to replace the entire set of belts.

**Figure 20**

5.2 Spring Breakback Setting - Antishock System

Sniper HD Offset machines feature three springs fitted to the headstock to allow the machine to automatically breakback if the machine comes into contact with an item or if it needs to follow uneven terrain when in work.

These springs should be fitted to the machine at all times as shown in Figure 21.

The springs should be tightened and compressed equally to a specific length to allow the machine to breakback correctly against an obstacle. Measurements should be taken from the length of the spring as shown in Figure 21.

Tightening and compressing the spring will cause the breakback of the flail mower to happen at a higher level of force from coming into contact with an obstacle. Loosening and releasing the spring compression will cause the breakback of the flail mower with a lower force.

The spring breakback system setting should be set by trial and error. Spearhead Machinery recommends an **initial starting length of 145mm** and for the machine to be tested in work; see Table 5. If the machine is breaking back too often, the springs should be tightened to compress them further. If the machine is breaking back not often enough, the springs should be loosened to compress them less.

The **breakback spring should not be compressed to any length less than 120mm** to ensure that the machine breaks back at some point; see Table 5. No breakback may cause damage to nearby components of the springs.

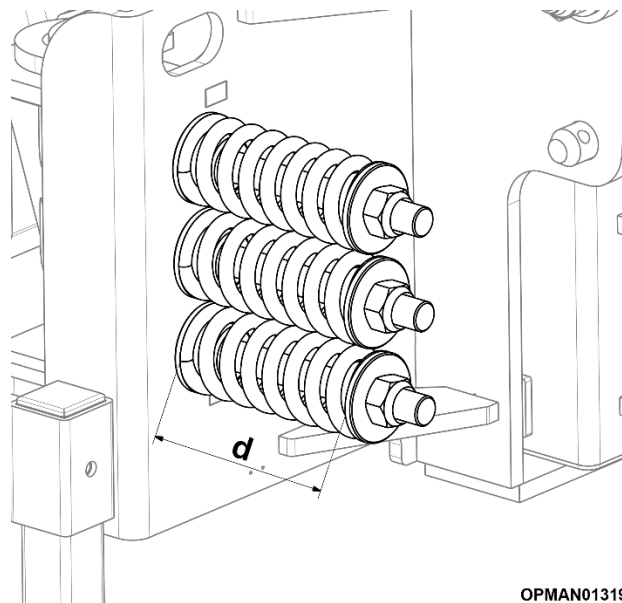


Figure 21

Setting	Spring Length "d"
Spearhead Recommended Breakback Length	145mm
Minimum Breakback Length	120mm<

5.3 Cleaning The Mower



DANGER! This operation is extremely hazardous so the following instructions must be followed.

- Wear protective gloves and shut off the engine of the agricultural tractor, subsequently disconnecting the input PTO shaft;
- For cleaning at the end of work, before completely stopping the machine, leave it on for 20-30 seconds so that any material residue is ejected;
- The Mower must be cleaned using an air jet, water with non-hazardous chemicals and cloths.
- Eliminate any residue of material or dust from the external surface of the machine.

5.4 Lubricants

With reference to Figure 22, following lubricants are to be used for the different parts of the machine:

- For the transmission box (1): SHELL SPIRAX S2 A 80W-90 or equivalent responding the API - GL5/MIL-L-2105C specifications is recommended. The quantity of oil is **1,2 lt.** Do not exceed the prescribed quantity;
- For all (2), (3), (4) and (5) greasing points: GRASSO SHELL RETINAX WB 2 equivalent is recommended.

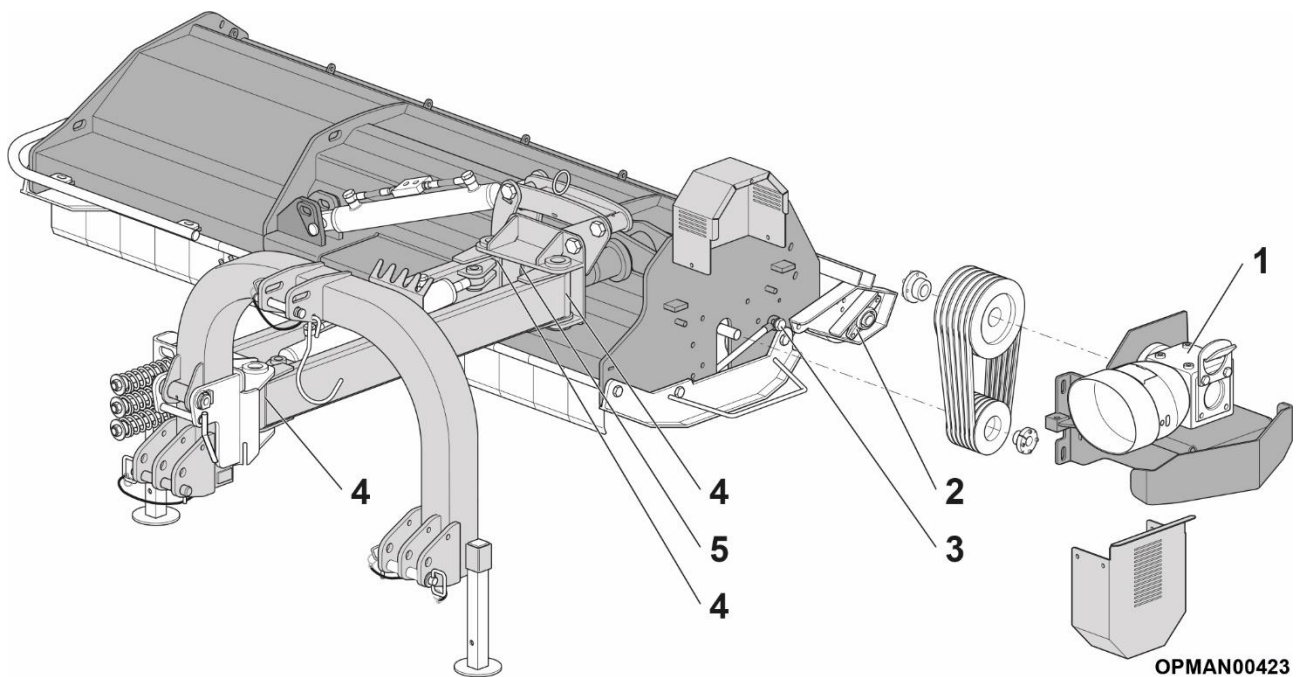


Figure 22

6 Troubleshooting

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

Problem	Cause	Remedy
Excessive cutting of the product to be cut	Mower too low	Slightly raise the Mower from the ground, adjusting the height
	Forward speed too slow	Increase the forward speed
Limited cutting of the material to be cut	Mower too high	Slightly lower the Mower from the ground, adjusting the height
	Forward speed too high	Reduce the forward speed
	Terrain too wet or muddy	Wait for the terrain to dry
Rotor clogging	Terrain too wet or muddy	Wait for the terrain to dry
	Mower too low	Raise the Mower from the ground
	Forward speed too high	Reduce the forward speed
Drop in rotor speed	Belt overheating	Adjust belt tension
The Mower bounces on the ground or vibrates	Foreign bodies stuck between the flails	Clean the rotor and flails
	Flails mounted incorrectly, without the helical layout or with the edge penetrating the terrain	Check and re-install the flails
	Worn or broken flails	Replace the flails
	Deformation of the rotor due to foreign bodies having hit the central part	Replace the rotor. Contact the Spearhead service centre
Roller support bearing seizure	No oil lubrication	Verify oil level
	The machine does not move sideways	Check the oil level and condition of the ram (optional)
	The machine does not rotate	Check the oil level and condition of the ram (optional)

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7 Spare Parts

7.1 How To Obtain The Correct Spare Part Numbers

For correct part numbers; use the Spearhead interactive online parts books. These are available at <https://my.spearheadmachinery.com/parts/public-interactive-parts-database/>. You will need to enter the machine serial number; see Figure 23.

7.1.1.1 Enter the serial number.

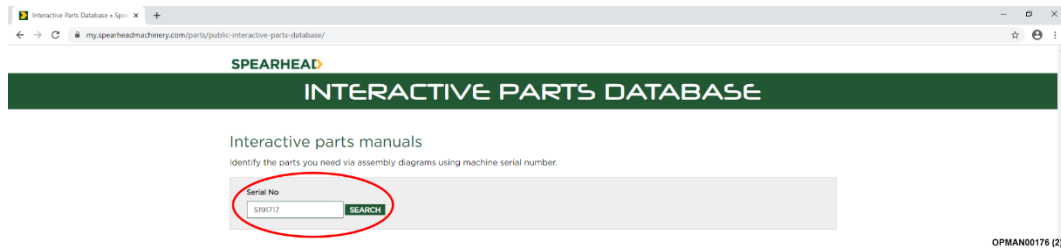


Figure 23 – Type In Serial Number

7.1.1.2 After entering the serial number a specification for the machine will appear. Click on the serial number; see Figure 24.

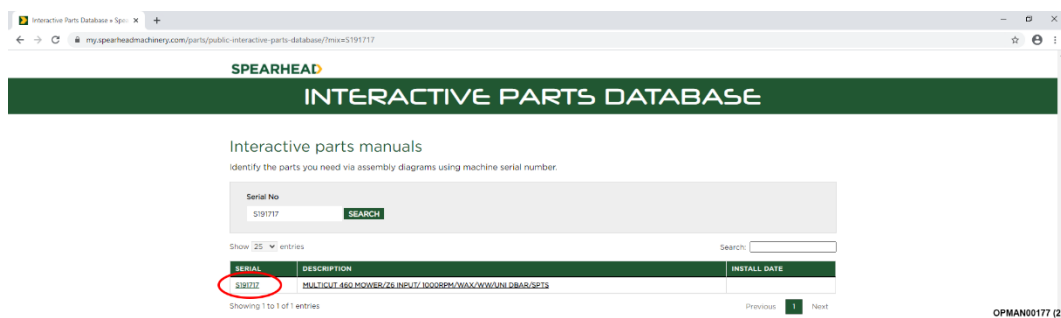


Figure 24 – Click On Serial Number

7.1.1.3 After clicking on the serial number a full parts breakdown, specific to the machine serial number will appear showing the various parts and assemblies of the machine. Click on the specific assembly picture required; see Figure 25.

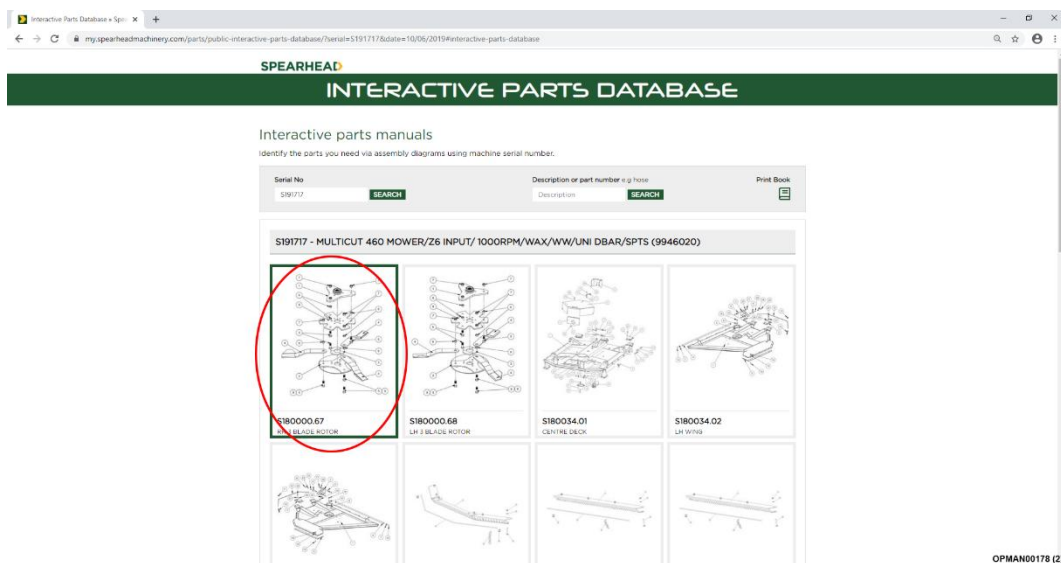


Figure 25 – Click On Assembly

- 7.1.1.4 You will finally be presented with a full exploded parts breakdown for that particular assembly, giving part numbers and the quantities required; see Figure 26.

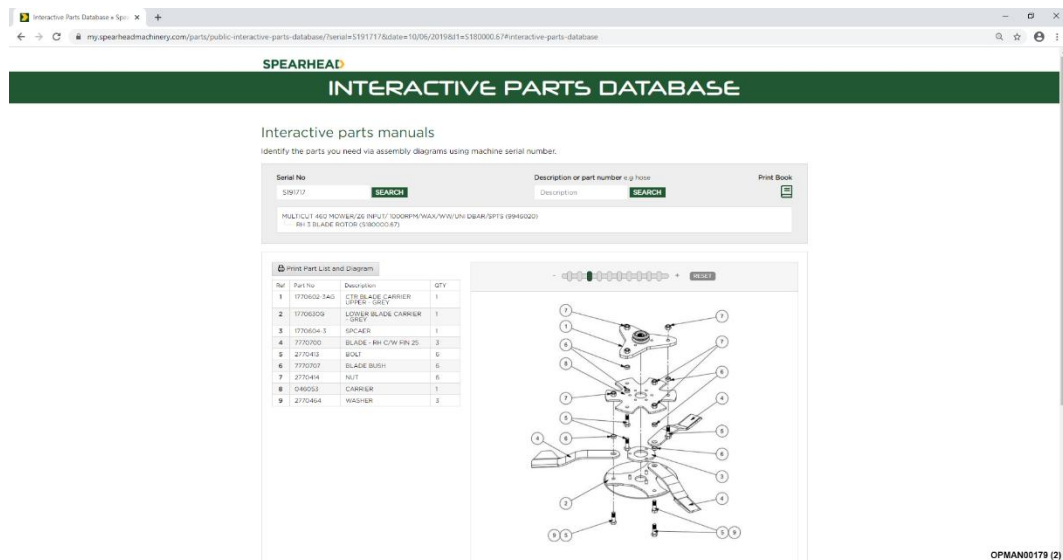


Figure 26 – Exploded Parts Breakdown With Bill Of Materials

7.2 Spare Parts Ordering

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

For guidance on finding your local Spearhead dealer; see Section 7.3.

7.3 Dealer Network

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

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

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

To find your local Spearhead dealer enter your location or postcode into the “Your location” box and then press “Search”; see Figure 27.

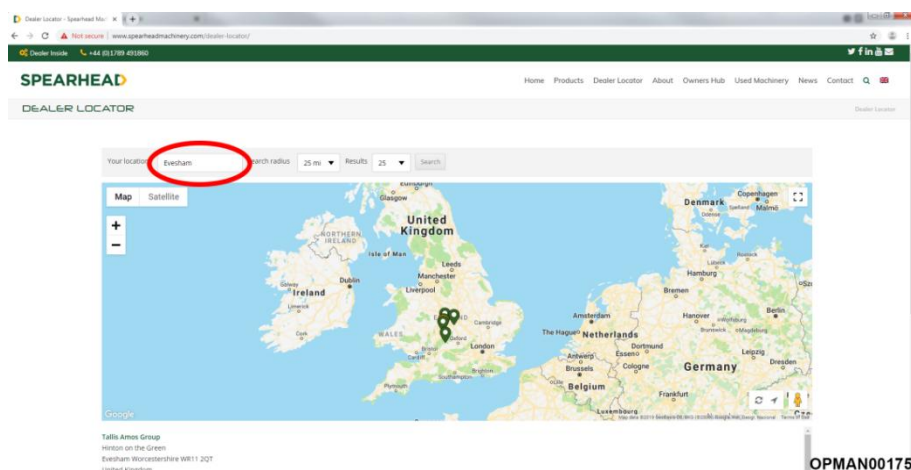


Figure 27 – Dealer Locator

Notes

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