

**Spearhead Machinery
Operator Instruction Manual For**

TWIGA MINI

2.6m-3.7m cut width

Vegetation control reach arm mower and cutterbar attachment

8999182EN v1.0

IMPORTANT

Verification Of Warranty Registration

Dealer Warranty Information & Registration Verification

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

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

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

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

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

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

Registration Verification

Model Type:		Twiga Mini
Model Number:		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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Twiga Mini Reach Arm Mower With Cutterbar Attachment

This manual covers the Twiga Mini series of tractor mounted reach arm mowers with cutterbar attachments.

These machines are available in a:

- 2.6m standard arm variants with 1.2m cutterbar attachment (Twiga Mini S26)
- 3.7m standard arm variants with 1.6m cutterbar attachment (Twiga Mini S37)
- 3.7m variable forward reach arm variants with 1.6m cutterbar attachment (Twiga Mini VFR37)

All variants of machine are available in left-hand and right-hand builds to cater for different markets.

These machines are designed to be fitted on Category 1 tractors with a starting minimum horsepower of 20hp (15kW) (S26) and a minimum tractor weight starting from 500kg (1102lbs) (S26). See the specific minimum tractor weight requirement of each specific reach arm model in Section 1.6.

All machines are all fitted with hydraulic rams which allow for the cutting attachment to be placed in infinite positions and allow the reach arm the ability to compactly fold making the machine legal for road transportation.

Twiga reach arm machines can be specified with various specifications of hydraulic supply and control operating systems to suit the end user's specific requirements.

It is essential that the safety guards are always fitted during operation and that the machine is operated in line with the procedures and practices detailed in this manual.

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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1 Introduction

1.1 Preliminary Information

Each hedge cutter is supplied with a copy of this manual. The instructions contained herein are applicable to all models of the Twiga Mini series.

All users (operators) of the hedge cutters must read this instruction manual before using the machinery. Unfamiliarity with the machine, improper use and non-observance of the safety rules could cause serious injuries to the operator and/or damage to the hedge cutter. All this can be avoided by carefully following the indications given in this booklet.



WARNING! All technical safety measures against impacts of handling and risk of cuts, adopted in the design of the hedge cutters (currently the same for all manufacturers) do not allow absolute safety. Unfortunately there is still a residual risk which cannot be eliminated due to the particular operating characteristics of the machine. It is therefore essential that no one stand within the machine's working range when it is in operation. Special care should be taken when working near roads and/or buildings.

1.2 Information About The Manual

This manual must be kept in good condition, complete in all its parts and on the machine for consultation if necessary. Please read this instruction and maintenance manual carefully and follow all indications precisely both before and after use, check-ups and operation. Should the user find it difficult to understand any of the instructions given herein, we kindly ask them to contact their local Spearhead dealer or Spearhead Machinery. They shall clarify any points and may also decide to improve sections of the manual so they are easier to understand. The revised parts will be sent to the customer.

This manual has been drawn up in compliance with the regulations currently in force and/or technical knowledge available at the time of going to print. It is an integral part of the machine and must be kept with the machine should it be sold on.

Some of the figures in this manual illustrate details or accessories which could be different from those on your machine. Please contact your local Spearhead dealer or Spearhead Machinery if you have any doubts.

The instructions in this manual are intended for professional operators with specialised knowledge of how to drive the tractor that the machine will be fitted to. They must be authorised, experienced and suitably trained.

The machine must be used by a single operator in compliance with the instructions in this manual; any use other than the one specified is considered improper and may lead to serious risks for objects and persons. No changes may be made to the machine or the conditions of use. If the operator identifies possible risks which have not been foreseen by Spearhead, they must stop using the hedge cutter and immediately notify Spearhead Machinery so they can carry out an in-depth assessment of the risk and modify the machine to meet the proper safety requirements.

The following terms are used in this manual:

- **Right/Left** indicates the parts of the hedge cutter as seen when standing behind the tractor with the machine attached to it; facing the work direction.



WARNING! Indicates that the operator must be familiar with all aspects of this particular subject;

- **NOTE** indicates a subject which will make the operation of the machine easier for the operator.

1.3 General Features Of The Hedge Cutter

The hedge cutter is a modern piece of equipment that allows grass and hedge cutting and pruning. It can be fitted to the hydraulic lifting system of any tractor provided it has a universal three-point hitch. Its functions are completely hydraulic thanks to its connection to two hydraulic valves located on the rear of the tractor.

The hedge cutter features valve block cable controls that are located inside the tractor cab and allows the operator to fully control the machine and keep watch over the road all while remaining comfortably seated.

The hedge cutter is produced in a STANDARD model (with flexible cable commands) and in an OPTIONAL model (with electrohydraulic proportional controls).

1.4 Identification

Each machine is equipped with a serial plate; see Figure 1.2 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.

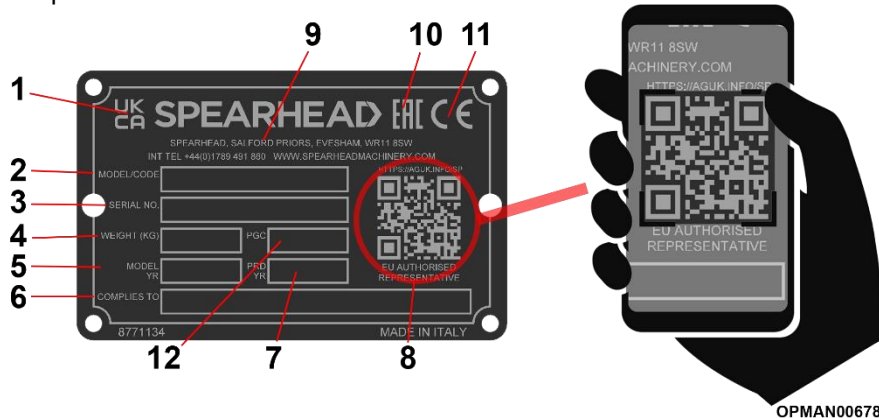


Figure 1.2 – Serial Plate

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 1.2) using a suitable QR scanning App, you can find details for Spearhead Machinery authorised representatives for its various territories.

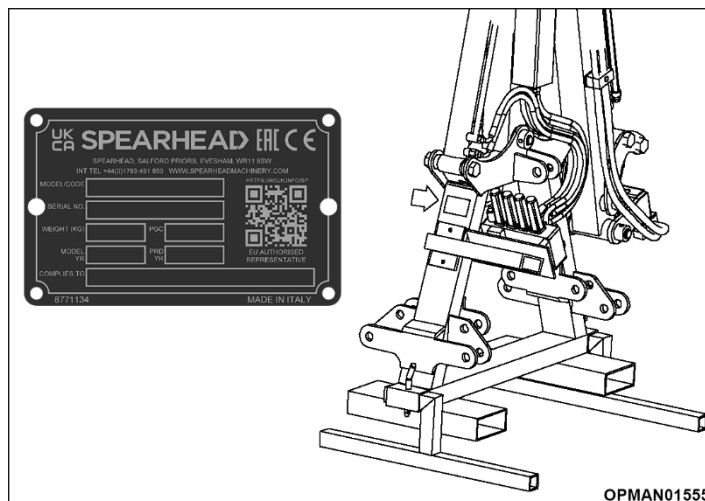
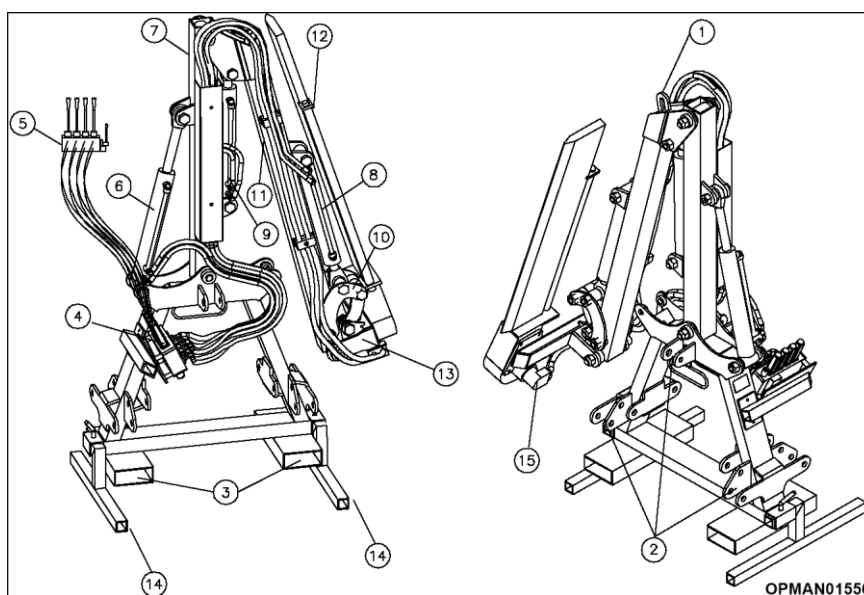


Figure 1.3 – Serial Plate Location



WARNING! It is absolutely forbidden to alter and/or erase the data on the identification plate or any data found on the machine parts.

1.5 Main Components



Item No.	Description.
1	Lift Coupling
2	Universal Three-Point Hitch
3	Lift System Hose Coupling
4	Valve Block
5	Control Levers (With Cables)
6	Main Arm Ram
7	Main Arm
8	Bar Angle Ram

Item No.	Description.
9	Dipper Ram
10	Linkage
11	Dipper Arm
12	Cutterbar Rotor
13	Bar Coupling
14	Leg
15	Cutterbar Motor

Figure 1.4 – Reach Arm Components
(S26 model shown)

1.6 Technical Data

1.6.1 Tractor Requirements

Technical Data	Model		
	S26	S37	VFR37
Minimum Power (hp)	20	30	30
Minimum Weight (kg)	500	700	700
Power Take-off Speed (rpm)	540	540	540
Minimum Tractor Width (mm)	1000	1200	1200
Three-point Hitch Category	I	I	I

Table 1.1 – Twiga Mini Tractor Requirements

1.6.2 Hedge Cutter Specification

Technical Data	Model		
	S26	S37	VFR37

Hydraulic System

Oil Tank Capacity (litres)	25	25	25
Filter (micron)	30	30	30
Hydraulic Oil (grade)	HD46 or equivalent		
Gearbox Oil (if applicable)	EP80-90 or GL-4/GL-5 or equivalent		
Circuit Pressure (bar)	180	180	180
Capacity (l/min)	15/20	20/25	20/25

Cutterbar

Working Width (mm)	1200	1600	1600
Weight (kg)	70	70/100	70/100
Max Cutting Diameter (mm)	20	20	20
Standard Weight (kg)	190	240	240

Table 1.2 – Twiga Mini Specification

1.7 Reach Diagrams

1.7.1 S26

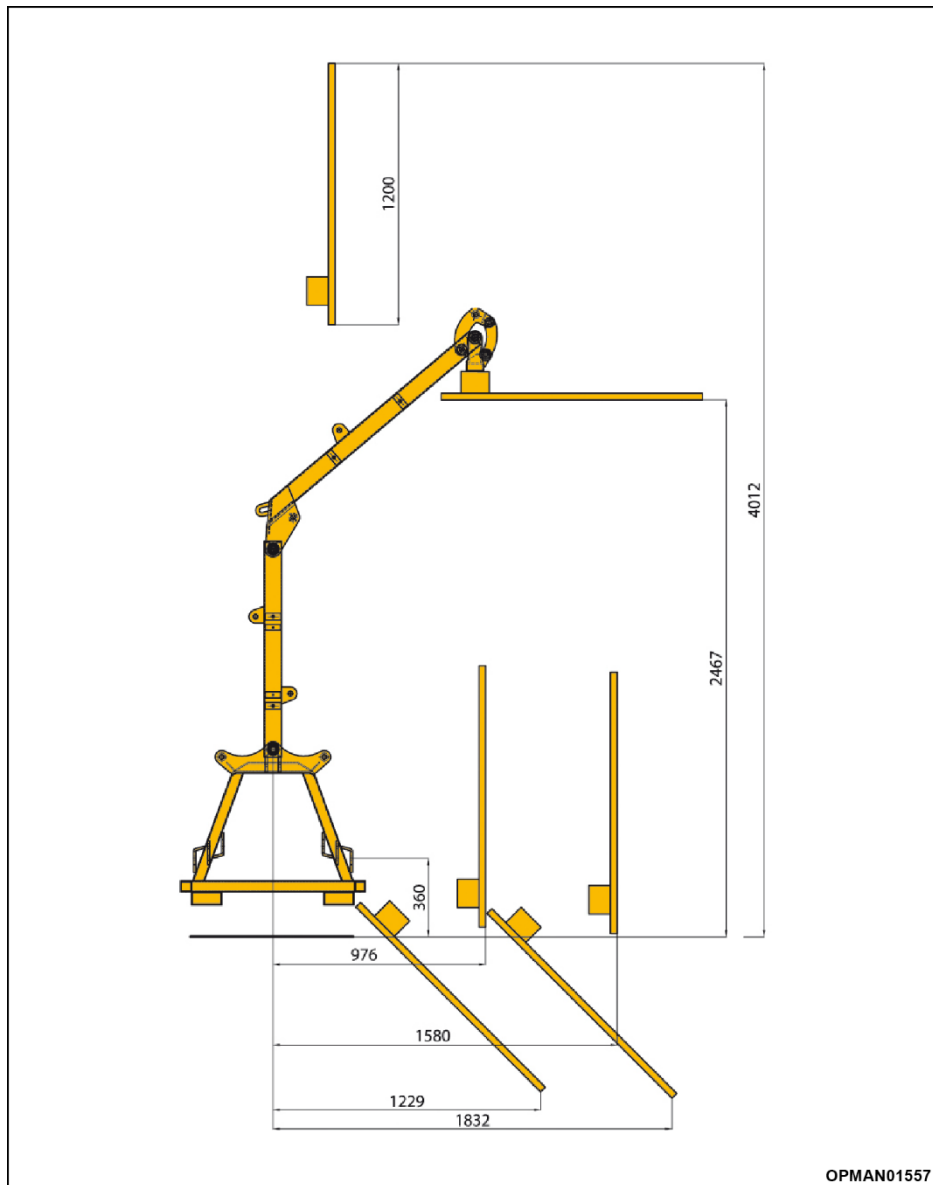


Figure 1.5 – Twiga Mini S26 Reach Diagram

1.7.2 S37

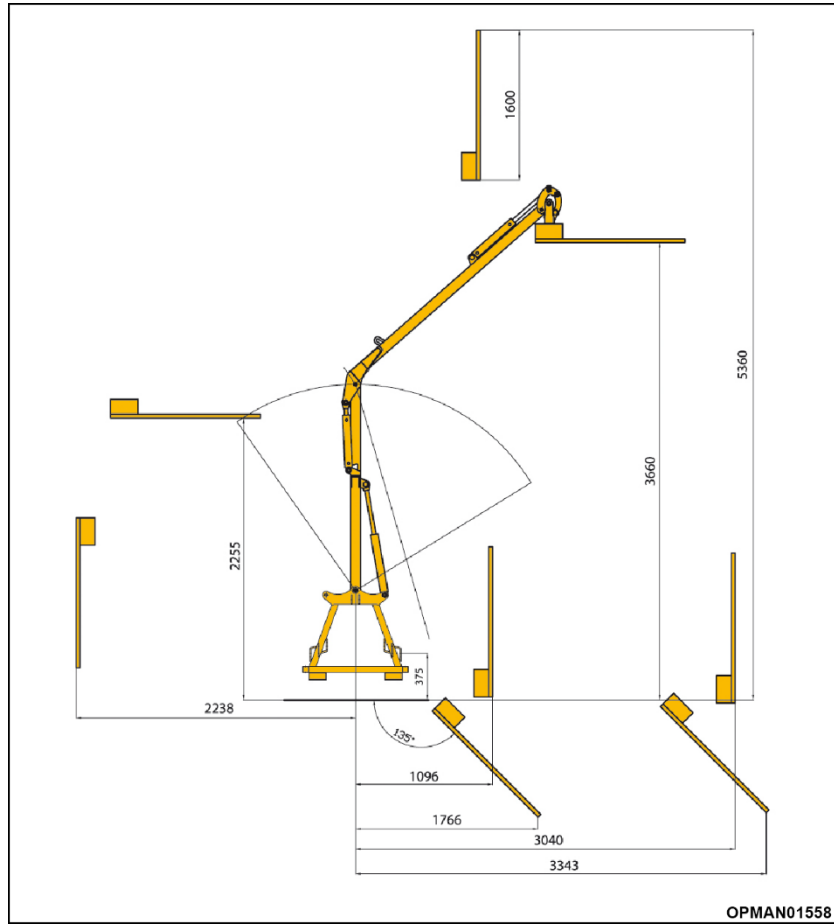


Figure 1.6 – Twiga Mini S37 Reach Diagram

1.7.3 VFR37

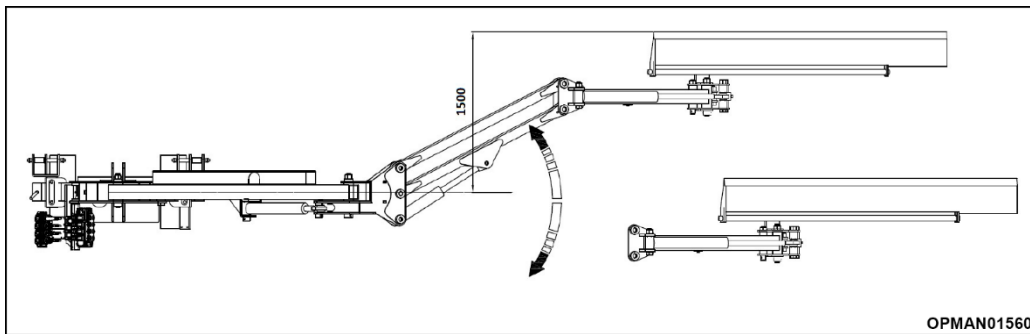
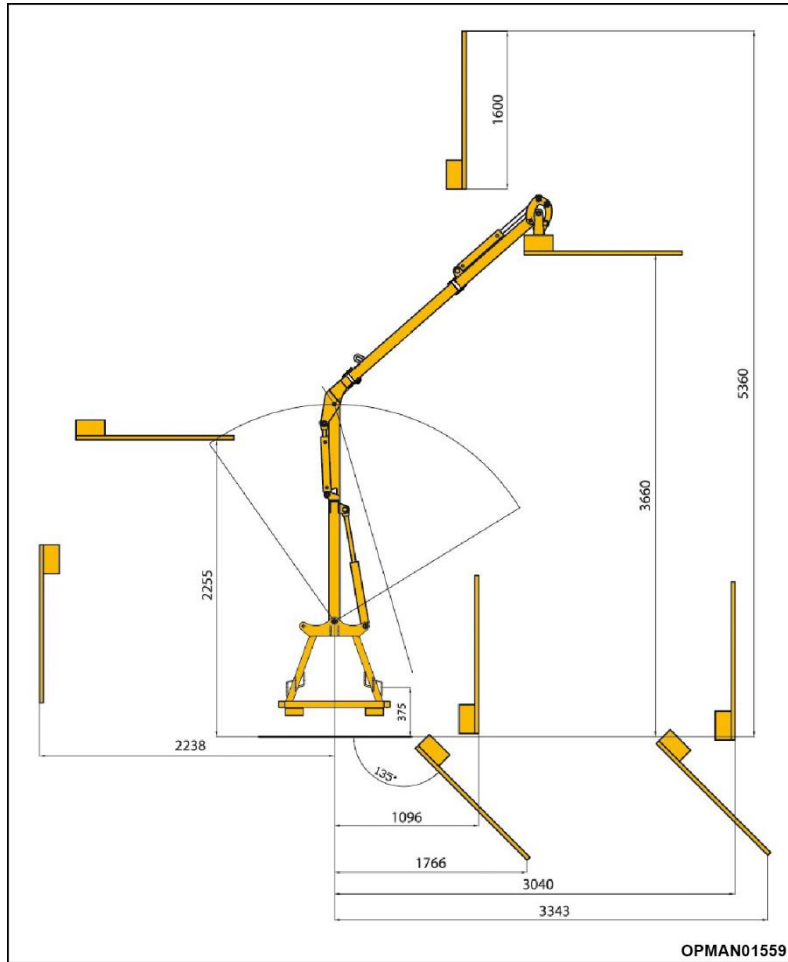


Figure 1.6 – Twiga Mini VFR37 Reach Diagrams

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2 Safety

2.1 General Safety Rules

Failure to obey even the simplest safety rules is the cause of most accidents in the workplace. The majority of accidents can be prevented if the correct safety measures are put in place beforehand. It is therefore extremely important to carefully read and follow all the instructions in this manual and take all the necessary safety measures before using the hedge cutter. The hedge cutter must be used by authorised personnel over the age of 18 who hold a driving license, are experienced, qualified and trained to operate it. Never use this machine if you are tired, ill or under the influence of alcohol, drugs or medicine. **Spearhead Machinery will not be held responsible for accidents caused by negligence on the part of the operator or by the non-observance of the safety rules.**

When the machine is being used, serviced, repaired, moved or stored, the operator must wear safety shoes, overalls, safety gloves and, if necessary, hearing protection (Section 2.4), a dust mask and a hard hat to protect against falling objects (especially when working at heights).

2.2 Safety Rules For Transportation, Installation And Use

The hedge cutter is secured in the TRANSPORT POSITION prior to delivery to the customer or dealer. This position must always be adopted when transporting the hedge cutter to the work site, even if it is already attached to the tractor.

To secure the machine in the transport position, proceed as follows:

- Cover the blades of the cutterbar rotor with a protective device.
- For the VFR model, before bringing the arms back, move the cutterbar back to the rear position.
- Retract the main and dipper arms so that they are parallel.
- Fully retract the cutterbar hydraulic ram and position parallel to the dipper arm.

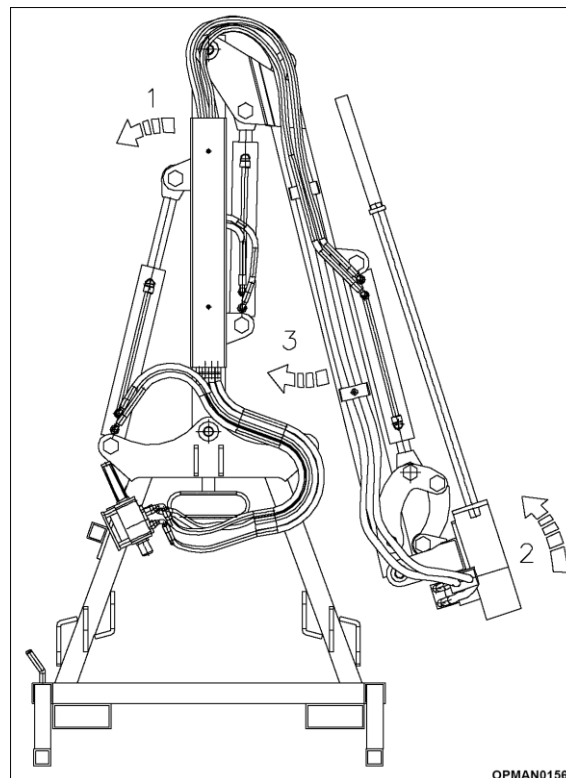


Figure 2.1 – Twiga Mini Arm Closing
(S26 model shown)

A label has been placed near the two connection points. The label contains the pictogram of a lock to show that these points serve to lock the machine in place.

2.2.1 Transport

The transport position is necessary to distribute the weight of the machine and allow for better balance. To lift the hedge cutter, use a crane equipped with the proper slings to hold its weight, which is given on the identification plate. Trained personnel must perform this operation, holding the hedge cutter by its hooking points, which are also marked by a sticker with a hook. Tie the hedge cutter to the truck/trailer to ensure it does not slip during transportation.

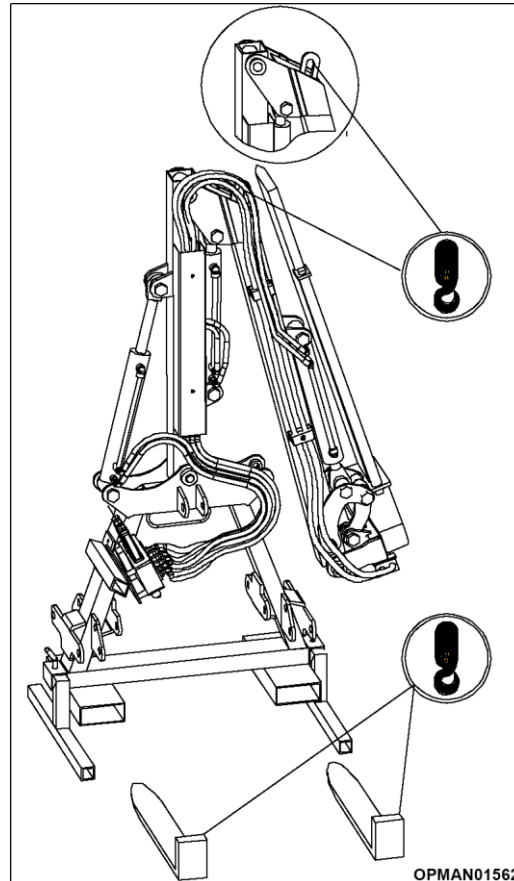


Figure 2.2 – Twiga Mini Lifting Point Locations
(S26 model shown)

If the hedge cutter is transported while still attached to the tractor, lift it by means of the tractor's hydraulic lifting system until its lowest point is at least 30 cm off the ground. Lock the lever activating the lifting system. Raise the stabilising feet on the hedge cutter and block them with the catch split pins.

Always follow the rules below when travelling on public highways:

2.2.1.1 The hedge cutter must always be in the transport position;

2.2.1.2 Apply the relevant warning signs to indicate the rear bulk of the machine and the tractor. It is useful to remember that:

- The FRONT OVERHANG must not exceed 60% of the length of the tractor without ballast;
- The REAR OVERHANG must not exceed 90% of the length of the tractor without ballast;
- The TOTAL LENGTH OF THE COMBINE should not be more than double the length of the tractor without ballast;
- The WIDTH of the hedge cutter must be less than 2.5 metres;
- The SIDE OVERHANG of the hedge cutter must not exceed 1.6 metres in relation to the tractor's longitudinal axis of symmetry.
- Should the maximum width of the hedge cutter exceed 2.5m or the side overhang be more than 1.6 m, it is necessary to obtain the relevant authorisation from the competent authority;
- Warning signs indicating the bulk of the hedge cutter must be applied on its three visible sides; they must be retroreflective and fluorescent with red and yellow stripes of the approved type

- 2.2.1.3 The flashing light on the tractor must be working;
- 2.2.1.4 The repeated indicators must have their own switch;
- 2.2.1.5 The hedge cutter control board must be protected by a frame to prevent the levers accidentally being activated;
- 2.2.1.6 The tractor's PTO must be disengaged and its lever locked;
- 2.2.1.7 The cutterbar rotor (cutterbar shaft) must not be moving, even for short distances;
- 2.2.1.8 The TOTAL MASS must not exceed 30% of the NORMAL mass of the tractor as indicated in the vehicle registration documents;
- 2.2.1.9 In static conditions the MASS transmitted by the driving axle of the tractor on the road must not be less than 20% of the NORMAL MASS;
- 2.2.1.10 Drive slowly, particularly on bumpy roads;
- 2.2.1.11 Follow all local traffic regulations;
- 2.2.1.12 The tractor is equipped for occasional use with a hedge cutter, but it is still a farm tractor in every respect.

2.2.2 Installation

The hedge cutter is usually attached to farm tractors by means of a universal three-point hitch which is commonly found at the rear of the tractor. All tractors must be equipped with a roll bar or a cab fitted with ROPS or FOPS as required by the regulations currently in force.

It is absolutely forbidden to attach the hedge cutter to tractors without a cab or a roll bar.

Before attaching the hedge cutter to the tractor, the customer must make sure that the tractor meets the following requirements:

- 2.2.2.1 It must be suitable to work with the hedge cutter;
- 2.2.2.2 It must have the necessary power;
- 2.2.2.3 It must have a hook (lifting device) which meets with regulations;
- 2.2.2.4 The tilting momentum of the first arm of the hedge cutter must be compatible with that permitted by the tractor. The figure indicates the weight and the centre of gravity with the boom arm at its maximum extension, in relation to the centre line of the tractor.

Since it is impossible to list all possible combinations of tractor and hedge cutter, for safety reasons each combination must be previously tested and deemed suitable to avoid the risk of overturning.

2.2.3 Tractor Balancing

The following steps must be taken to check the balancing of the tractor. Check the lifting capacity and longitudinal stability of the tractor using the following formula (referring to the drawing) and, if necessary, apply ballast.

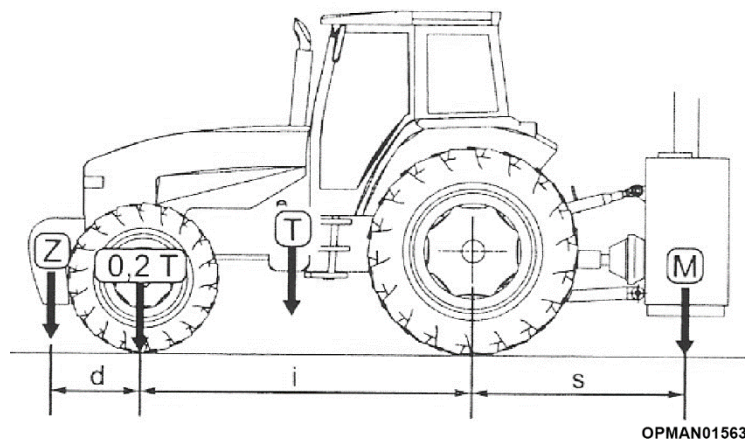


Figure 2.3 – Twiga Mini Lifting Point Locations

$$Ms \leq 0.2Ti + Z(d+i)$$

$$M \leq 0.3T (*)$$

$$Z \geq \frac{(Ms) - (0.2Ti)}{(d+i)}$$

In the formula:

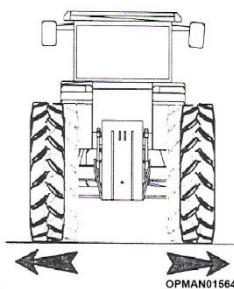
- **I** = tractor wheelbase
- **d** = distance from the front axle to the ballast
- **s** = overhang of the rear axle of the hedge cutter
- **T** = tractor mass+ 75 kg (operator);
- **Z** = mass of the ballast
- **M** = full-load mass

To calculate the overall weight of the machine, add up the individual weights of each of its parts.

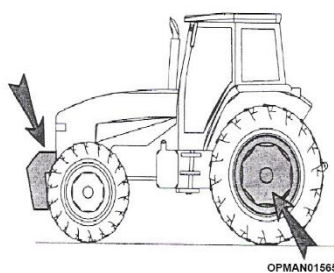
The front tractor axle is lightened in relation to the weight attached when the hedge cutter is fixed to the tractor: the load of the front axle must be at least 20% of the empty tractor weight. It is mandatory to check the lifting capacity and stability of the tractor to prevent overturning and/or the steering wheels losing their grip.

After the hedge cutter has been attached to the tractor, lift it completely off the ground and check the tractor does not lose its balance. Set the tractor wheels to maximum track (Figure 2.4), making sure this width complies with the value given on Table 1.1.

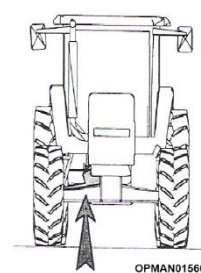
Apply the ballast where necessary: on the rear wheel of the tractor opposite the extended arm and on the front of the tractor (Figure 2.5). In extreme cases and only during operation, lock the front axle articulation by inserting a special mechanical lock (Figure 2.6).



**Figure 2.4
Wheel Track**



**Figure 2.5
Ballast**



**Figure 2.6
Front Axle Articulation**



WARNING! Never work with the arms extended when the tractor is on sloping ground. Always secure the hedge cutter in the central position during transportation.

2.2.4 Use

The hedge cutter must only be used for the operations it was designed and built for. Its technical features must not, in any way, be modified to alter its performance. Failure to comply with this rule will result in the warranty becoming null and void and Spearhead Machinery being immediately released of any liability.

Before starting the tractor, always perform the daily maintenance operations (described in Section 2.2.1) and take the following precautions:

- 2.2.4.1 Check the position of the ballast on the tractor in relation to the different distribution of the weights on the axles; always take this into account when driving, particularly when turning and using the brakes, to ensure safe driving (see Section 3.5);
- 2.2.4.2 Make sure the hedge cutter has been correctly attached to the tractor and that all the locking and safety devices are in place and in good working order;
- 2.2.4.3 Check the tractor is equipped with rear view mirrors on both sides of the cab and if it is not, fit them. The operator must be able to check both the traffic and the hedge cutter while working;
- 2.2.4.4 Make sure the PTO is disengaged with the lever locked and that the rpm is correct (540 rpm);



WARNING! The PTO must always be engaged when the engine is off;

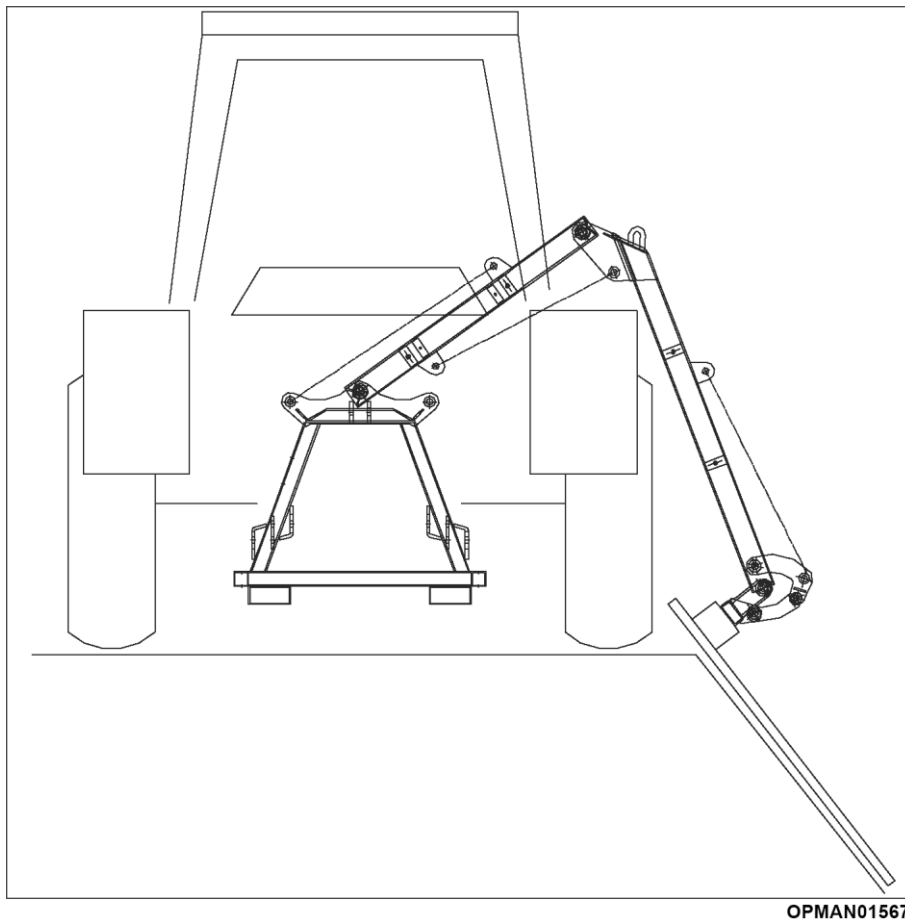
- 2.2.4.5 Check all the control levers are in the neutral position "0"; see Section 4.1.2;
- 2.2.4.6 Make sure there is nobody within the working range of the cutterbar.
- 2.2.4.7 The operator must keep a clear work range – both in front of and behind the bar – of about 20 metres and in all directions, for a total radius of 20 metres;
- 2.2.4.8 Never wear clothing which could become entangled in the moving parts.

Start the tractor engine and engage the PTO. Before setting out for the work site, the operator must familiarise themselves with the machine and the control levers, moving them in sequence to check how each function works. Unfamiliarity with the machine, improper use or a wrong movement could cause serious damage to people and objects.

When the machine is being transported and then when it is in operation, the operator must take the following precautions:

- 2.2.4.9 Never allow any passengers on the tractor;
- 2.2.4.10 Never carry people or animals on the hedge cutter;
- 2.2.4.11 Never use the arms or the cutterbar to lift people or objects;
- 2.2.4.12 Never use the cutterbar in immersion;
- 2.2.4.13 Always make sure the tractor wheel is not too close to the kerb.
- 2.2.4.14 The operator must always check the conditions of the road surface and keep at a safe distance from the bank. Never use the machine on steep banks as it may jeopardise the stability of the tractor/hedge cutter;
- 2.2.4.15 Never stand between the hedge cutter and the tractor, even if the handbrake is applied and there are blocks under the wheels;

- 2.2.4.16 Never work with the boom arm extended when on sloping ground and check the tractor's stability every time;
- 2.2.4.17 Do not leave the tractor with the engine running and when stopping the machine, take all steps to guarantee safety and stability.



OPMAN01567

Figure 2.7

Stop working immediately if:

- 2.2.4.18 There are hard objects such as manholes, pits, guardrails, railway tracks etc. in the vicinity. If they are hit, this could break the knives which would be thrown at high speed;
- 2.2.4.19 Wires, chains or similar objects get entangled in the rotor. To prevent damage or dangerous situations, stop the rotor and free the machine following all the safety rules. **It is forbidden to try to disentangle the rotor with the engine running by inverting the direction of rotation;**
- 2.2.4.20 The cutterbar vibrates. To prevent breakages and serious damage, stop the rotation of the rotor and remove the cause of the vibration, following all the safety rules;
- 2.2.4.21 There is an oil leak. **Never use your bare hands to look for a leak but use a rag and protective gloves. When under pressure, oil could seep into your skin, causing serious infections.**
- 2.2.4.22 **VFR:** The VFR model allows the cutterbar to move forward because of a parallelogram motion in the second arm; with the first arm closed the forward motion should not be performed since it might strike parts of the tractor. **Be especially careful about movements towards the front.**
- 2.2.4.23 To control the forward motion, the operator must make certain that the machinery and the tractor do not strike each other.

2.3 Personal Safety

As previously stated, the hedge cutter must be operated by qualified, trained personnel over the age of 18 who are familiar with the instructions in this manual. Safety is of the utmost importance, particularly during repair and maintenance operations. Never tamper with, remove or disable the guards and safety devices which have been fitted to the machine to ensure the safety of the operator and other people and/or objects.

Spearhead Machinery shall not be liable if:

- The hedge cutter is used improperly or by untrained personnel
- The maintenance schedule is not respected
- Unauthorised changes or operations are carried out
- Non-specific and/or non-original spare parts are used
- The operator fails to follow the instructions in this manual
- The operator fails to follow common safety rules in the workplace
- Exceptional events occur

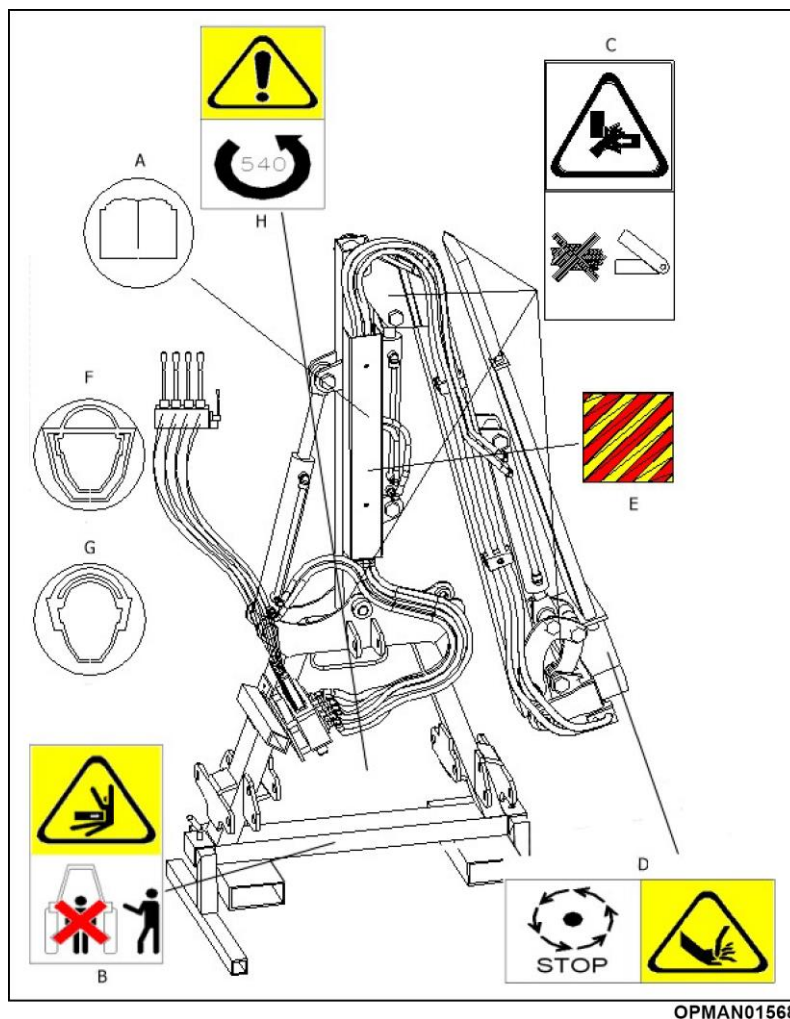


Figure 2.8 – Safety Sticker Locations

Since the instructions in this manual cannot possibly take all the situations which may arise during operation (some are unpredictable) into account, the operator must exercise caution and use common sense.

In addition to the instructions in this manual, stickers illustrating the safety rules are applied to different parts of the machine to assist the operator. The stickers have different shapes and colours depending on the rule. The operator must therefore be aware that round stickers indicate obligation (light blue and white) or prohibition (red, white and black) while triangular stickers indicate danger (yellow and black). Rectangular stickers indicate danger or prohibition and also provide additional information about the safety rule to follow.

With reference to Figure 2.8, the safety rules illustrated on the stickers on the hedge cutter are:

- Always read or consult the instruction and maintenance manual (A);
- Danger of serious bodily injury. The operator must prevent people from entering the working area because of the movement of the arm and cutterbar (B);
- Danger of crushing and/or shearing of upper limbs (C);
- Danger of serious injury to upper and lower limbs. If you have to intervene, use caution and wait for the rotor to come to a complete stop (D);
- One fluorescent panel must be attached to the sides of the tractor to signal the protruding bulk (hedge cutter) (E);
- Face shields compulsory. Protect your face and eyes (F);
- Ear protectors compulsory (G), see Section 2.4;
- Pay attention to the tractor rpm and, therefore, to PTO output (must run at 540 rpm/min.) (H);



WARNING! All stickers must be replaced before they become illegible. If one does, the operator may not use the hedge cutter until a new one has been applied.

2.4 Noise Level

The noise level of this machine, measured at the operator's position, is between 65.4 and 68.5 dB when the tractor cab is closed and between 70 and 74.5 dB when the rear cab window is open. The sound power level is LWA 103.2. If the sound level, perceivable at the operator's position, exceeds 85 dB, it is advisable to wear ear protectors.

Taking into consideration the sound levels recorded in the various positions, if the cab is not soundproofed, it is advisable to use personal hearing protection.

2.5 Overhead Dangers

When working with the cutterbar raised, as illustrated in the Figure 2.9, the operator must take extreme care if there is a power line (electric or telephone) in the vicinity. The distance between the power line and the upper part of the hedge cutter must be at least 1 metre. It is advisable to carry out any work with a technical engineer of the company responsible for the power line in attendance.

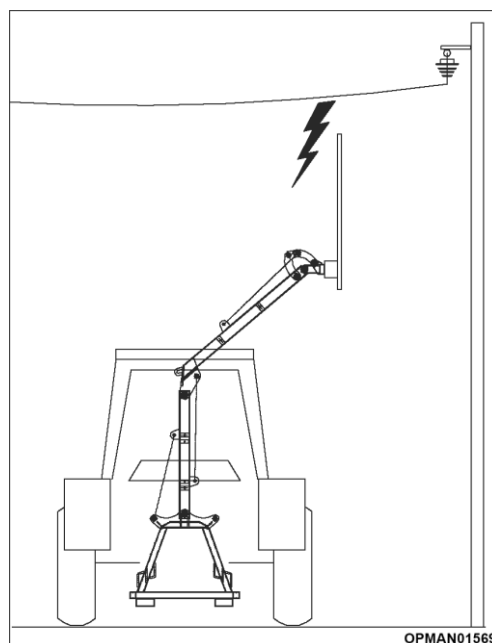


Figure 2.9



WARNING! It is highly dangerous to work with the cutterbar in this position. Never allow anyone within 80m of the cutterbar side of the tractor, in front or behind it (basically in any direction where the knives can be seen, also bearing in mind the effects of the knives rebounding should they break).

3 Installation

3.1 Preliminary Information

The hedge cutter can be attached to any tractor which has a universal three-point hitch. To do this, the machine must be placed on flat, level ground in an area which has been set aside for the purpose. The person who attaches the hedge cutter must be familiar with the safety rules for this particular operation and proceed with the utmost care and attention. Take the necessary precautions where working in the area where the rods of the tractor's lifting arms are located, as there is the risk of injury due to crushing and cutting.



WARNING! When aligning the holes on the tractor hitch with the corresponding holes on the hedge cutter frame, never use your bare hands but a tool designed for this purpose.

3.2 Attaching To The Three-Point Hitch

First of all, the operator must completely lower the lifting system and must successively retract the hedge cutter gradually into the transport position.

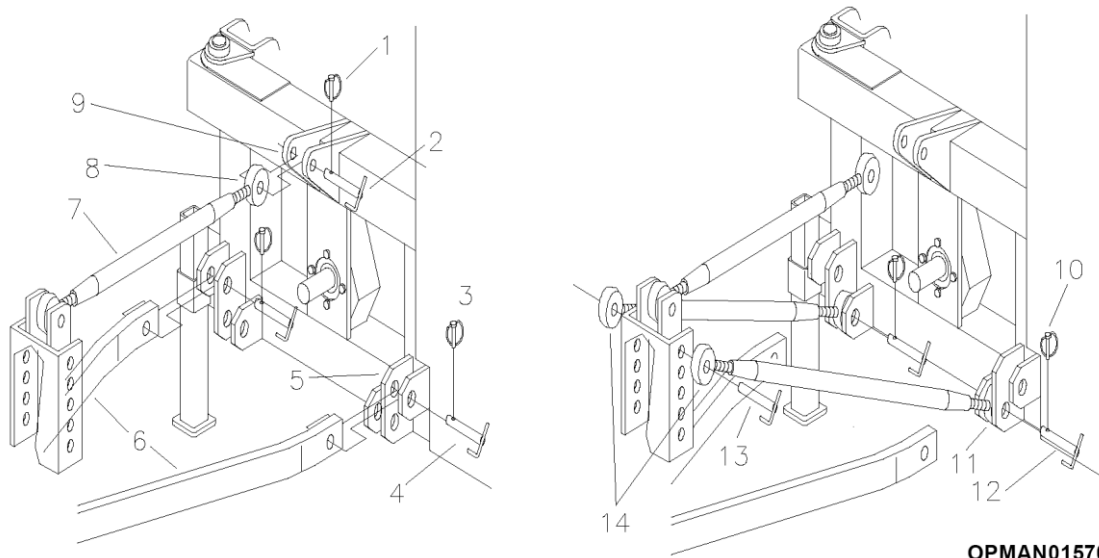


Figure 3.1

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With reference to Figure 3.1, once in the right position, turn off the tractor engine, leave the lifting arm at its lowest point and lock the lever controlling it. Apply the handbrake, if necessary place the tractor in neutral and remove the key from the ignition. Place the arms of the lifting system (6) in the corresponding hitching points on the hedge cutter frame (5) and secure them, one at a time, with the pins (4) which must then be secured with the safety pins (3). Next insert the adjustable tie rod (7) into its corresponding position on the upper arm of the tractor and secure it with the pin which is supplied with the tractor.

Tighten or loosen the tie rod while leaving the ball end connection unconnected (8) until it is extended to the correct length with the hedge cutter frame (9). Secure the tie rod with the pin (2) and secure it with the split safety pin (1). Adjust the tie rod, start the tractor engine and lift the machine, shifting the lever of the hydraulic lifting system, until its PTO shaft is approximately at the same height as the PTO shaft of the tractor (consult the instruction manual for the installation of the universal joint).

At this point, switch off the tractor engine and lock the lever operating the hydraulic lifting system. Adjust the tie rod by moving it until the hedge cutter frame is in a perfectly vertical position. Tighten the lock nut. In order to give the hedge cutter most stability during operation, it is advisable to add some more stiffening tie rods (14). They should be inserted into the lower holes of the external side connections (11) of the hedge cutter and into the upper holes of the tractor's central support.

On the hedge cutter, the operator must insert the pins ball end connections of the two tie rods into their corresponding positions and secure them with pins (12) and split safety pins (10).

On the tractor, on the other hand, position the tie rods one at a time in the central support by aligning the holes and then secure them with the pins (13) which are supplied with the tractor.

Finally lock the arms of the tractor lifting device with the tie rods or chain which they are supplied with.



WARNING! With the stiffening tie rods already in place. Check continuously that the lever controlling the hydraulic lifting system is locked, as this device must never be used.

Risk of injury in the rear lifting arm linkage area of the tractor due to crushing and cutting areas.

3.3 Hedge Cutter With Independent Hydraulic System

Hedge cutters can be supplied with an independent hydraulic system that includes tank, filter and pump/gearbox assembly. To activate the hedge cutter hydraulic system the pump/gearbox assembly must be mounted on the tractor PTO, Therefore, check if this assembly is designed to run at 540 rpm with clockwise rotation.



WARNING! Install while the engine is off.

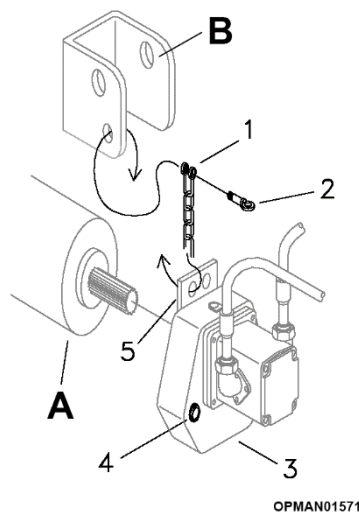


Figure 3.2

With reference to Figure 3.2, insert the pump/gearbox group (3) onto the tractor's PTO (A) and secure with the bracket (5) via a chain (1), to a fixed tractor point (generally near the 3rd hitching point (B)). The chain, locked in place by a protection device, impedes rotation and prevents assembly release.



WARNING! Run the hedge cutter with no load for a few minutes after installation. Activate all hydraulic rams to allow for air purging from the hydraulic circuit.

NOTE: make sure that there are no oil leaks or bleeding; make all necessary repairs.

3.4 Hedge Cutter Without Independent Hydraulic System (Standard)

Twiga Mini hedge cutters can directly exploit the tractor's auxiliary circuit. In this case, quick-coupling hoses connect the hedge cutter hydraulic circuit to the tractor's auxiliary hydraulic circuit.

Spearhead will provide the hedge cutter with quick-coupling hoses. This type of connection requires the tractor to be fitted with a double-acting control spool. It is best if the specific lever stops on the SUPPLY position instead of automatically reverting into "idle".



WARNING! Run the hedge cutter no load for a few minutes after installation. Activate all hydraulic rams to allow for air purging from the hydraulic circuit.

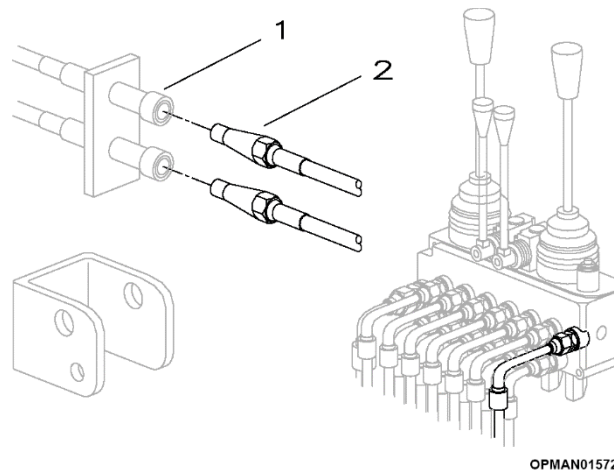


Figure 3.3

With reference to Figure 3.3, if not indicated, it is important to know which is the SUPPLY position for the tractors double-acting control spool. This position can be found by referring to the tractor's use and maintenance booklet. Mark and lock the lever in this position. This precaution is taken because using the spool in the reversed oil flow position could severely damage the hedge cutter's hydraulic circuit. Before making connection, clean both the quick-couplings and connections with a clean cloth. Connections on tractors are by standard female and arranged one below the other in a vertical direction so that one (top) is the supply and the other (bottom) is the return. The supply on hedge cutters will always be connected on the pressure control valve side of the valve block. Attach the quick-couplings (2) of the hedge cutter hydraulic circuit supply and return hoses into their respective connections (1) on the tractor.



WARNING! Run the hedge cutter no load for a few minutes after installation. Activation of all hydraulic rams allows for air purging from the hydraulic circuit. Make sure that there are no oil leaks or bleeding; make all necessary repairs.

3.5 Tractor Balancing

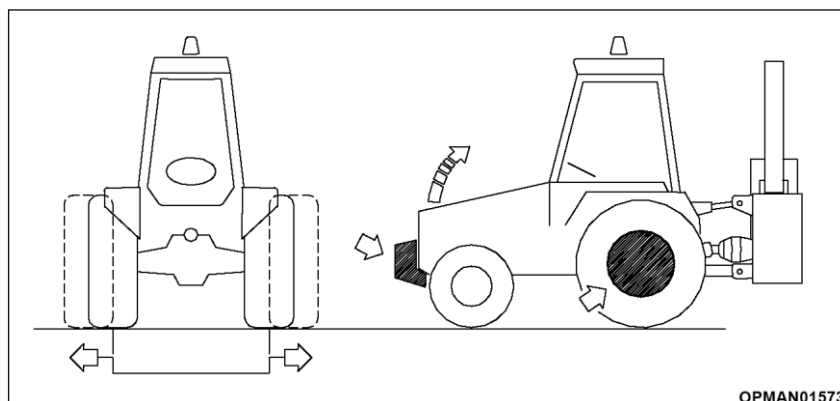


Figure 3.4 – Tractor Balancing

Due to the structure of the hedge cutter and the type of work it performs, it is necessary to protect the tractor from losing its balance and overturning. With reference to Figure 3.4, applying ballast to the front of the tractor, on the opposite side wheel of the tractor to the cutterbar attachment and setting the wheels to their widest track, make the tractor more balanced and safe.

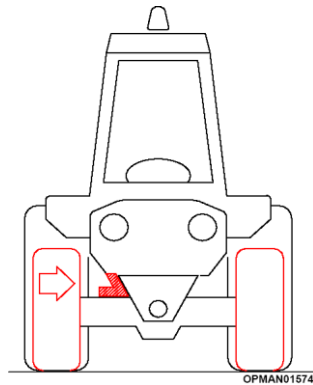


Figure 3.5

In extreme cases and only during operation, lock the front axle articulation by inserting a spacer between the frame and the axle, as illustrated in Figure 3.5. It is recommended you contact your local Spearhead dealer or Spearhead Machinery when carrying out this operation.

3.6 Removal

To remove the hedge cutter from the tractor, follow the instructions given in Section 3.5 in reverse order, so first remove the universal joint and then the hedge cutter.

3.7 Storage

Park the machine in a safe, sheltered place, on a flat, solid surface:

- Remove the stiffening tie rods if they are still fitted and store them separately;
- Lower and lock the supporting feet on the machine;
- Set the machine on the ground with the help of the tractor's hydraulic lifting system;
- Remove the hedge cutter from the tractor in reverse order as in Section 3.2;
- Protect it with a cover.

4 Operation And Use

4.1 Operation

4.1.1 General Instructions

Before each start-up, make sure that the hedge cutter is properly installed on the tractor and that it is complete in all its parts. After the precautions described in Section 2.2.3 have been taken, the following checks are to be performed:

- Check the number of revolutions of the PTO, making sure it is 540rpm;
- Make sure the rotational direction of the PTO is correct (clockwise);
- Check the level of the hydraulic oil in the hedge cutter tank and gearbox (if applicable);
- Check that all the joints with pins and bearings on the cutterbar rotor are sufficiently lubricated;
- Make sure all the flexible control cables are not twisted, pinched or too taut, which would impair their sensitivity and their response when a command is given;
- Make sure all the control levers are in the neutral "0" position;

See Section 4.2 for how to use the hedge cutter.

4.1.2 Controls

Two single-block hydraulic valves, which are installed next to each other on the machine frame, control the performance of the hedge cutter. Both are fitted with an anti-shock valve and a valve limiting the pressure and are connected by means of flexible cables (250 cm long) to the operators cable control system. This device, which must be mounted on a support in the tractor cab, has 5 levers to control the machine's functions and a safety diverter to prevent the rotational direction of the cutterbar rotor being accidentally inverted.

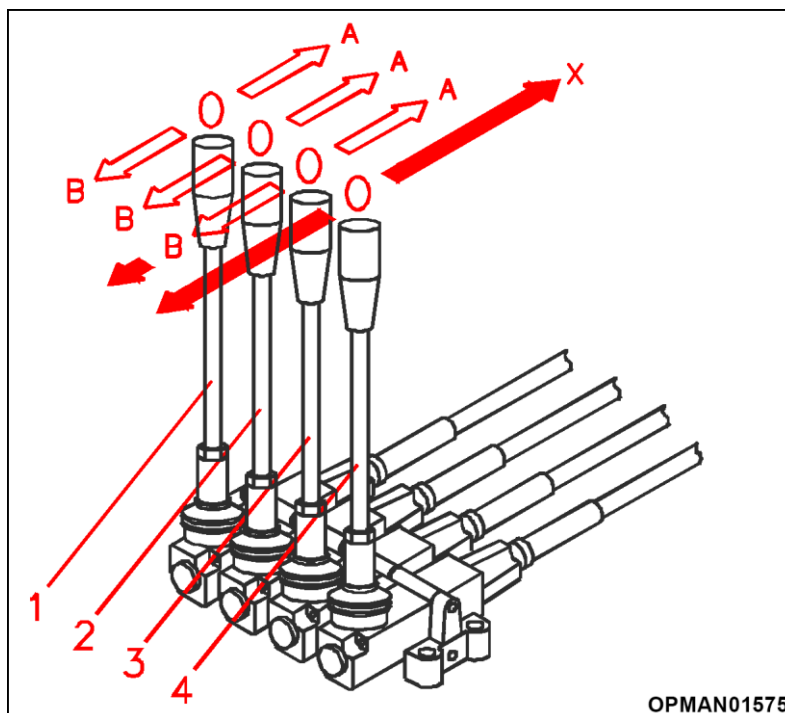


Figure 4.1
(S26/S37 control system shown)

With reference to Figure 4.1, on Twiga Mini S26 and S37 models, the control levers (1, 2, and 3) can be shifted from the neutral "0" position to A or B and they automatically return to the neutral "0" position once they are released. Lever (4) controls the rotation of the rotor and has a mechanical lock at the end of its stroke in both the X and Y positions.

This allows the operator to start the rotor, lock the lever in position and then perform other manoeuvres.

Twiga Mini VFR37 models feature an additional control lever (total of 5 levers), which allows the operator to control the position of the forward reach hydraulic ram.

NOTE: Moving a lever to a certain position achieves a precise function, like, for example, extending an arm. All the functions described below, and the corresponding lever movements, are illustrated on a decal in the cab near the controls. The controls consists of four or five levers and one diverter, which controls the function of one of them. Table 4.1 give operational guidance on the movements of the Twiga Mini S26/37 and Table 4.2 give operational guidance on the movements of the Twiga Mini VFR37.

4.1.2.1 Twiga Mini S26/S37

Control Lever Number.	Operating Item.	Position.	Motion.
1	Main Arm Ram	A	Close
		0	Neutral
		B	Open
2	Dipper Arm Ram	A	Close
		0	Neutral
		B	Open
3	Cutterbar Angle Ram	A	Lifting
		0	Neutral
		B	Lowering
4	Cutterbar Rotor Rotation	A	Clockwise
		0	Neutral
		B	Anti-clockwise
5	Safety Diverter	A	Allows Clockwise
		0	Neutral
		B	Allows Anti-clockwise

Table 4.1 – Twiga Mini S26/S37 Cable Control Lever Positions

4.1.2.2 Twiga Mini VFR37

In the VFR model, a lever has been added to control the forward and rearward movement of the cutterbar. In this case, the functions of levers 1 and 2 remain unchanged to the Twiga Mini S26/S37, while the third lever controls the VFR function. The last 3 levers have kept the same last 3 functions as on the standard models. Thus, the 3rd, 4th and 5th lever become the 4th, 5th and 6th levers.

Control Lever Number.	Operating Item.	Position.	Motion.
1	Main Arm Ram	A	Close
		0	Neutral
		B	Open
2	Dipper Arm Ram	A	Close
		0	Neutral
		B	Open
3	VFR Ram	A	Arm Forward
		0	Neutral
		B	Arm Rearward
4	Cutterbar Angle Ram	A	Lifting
		0	Neutral
		B	Lowering
5	Cutterbar Rotor Rotation	A	Clockwise
		0	Neutral
		B	Anti-clockwise
6	Safety Diverter	A	Allows Clockwise
		0	Neutral
		B	Allows Anti-clockwise

Table 4.2 – Twiga Mini VFR37 Cable Control Lever Positions

NOTE: If the levers are moved gently, small gradual movements are achieved. Maximum speed is achieved with the levers at the stroke end. Do not hold the levers all the way to the stroke end for long periods of time as this will cause the hydraulic oil to overheat. If the levers are moved gently, all movements will be safe and smooth. The operator will be safer and the hedge cutter will perform more efficiently.

A pressure-limiting valve is fitted on both valve blocks and keeps the working pressure of the hydraulic fluid within its values. The valve intervenes, stopping the oil flow and forcing it back into the tank, whenever there is an increase or a drop in pressure in the hydraulic system. Only Spearhead Machinery can calibrate or correct the values. To prevent tampering, the valve is sealed with red paint.

4.1.3 Joystick Controls

Twiga Mini machines can be equipped with joysticks. Usually, the joystick we provide has a magnet underneath it to make it easier to mount in the best position for use by the operator; see Figure 4.2 (MAG).

Grasp the joystick and keep the “deadman” button pressed; see Figure 4.2 (A). To control the arms, move the joystick in the direction indicated in the diagram at the bottom.

The functions available are:

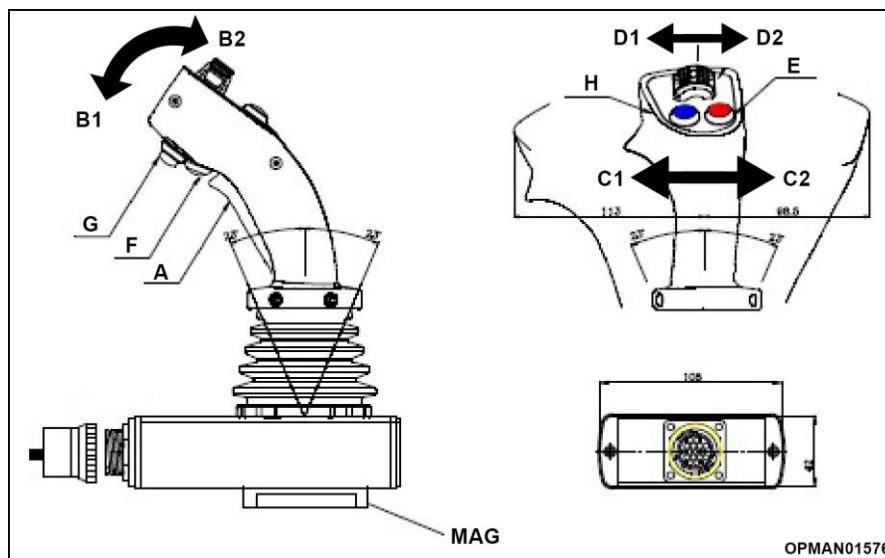


Figure 4.2 - Joystick Controls

Inputs.				Action.
First Item.	Second Item.	Third Item.	Movement.	
A	-	-	-	Deadman
A	B1	-	Push Forward	Lower Arm
A	B2	-	Pull Back	Raise Arm
A	C1	-	Push Left	Left-hand Build – Push Out Arm Right-hand Build – Pull In Arm
A	C2	-	Push Right	Left-hand Build – Pull In Arm Right-hand Build – Push Out Arm
A	D1	-	Scroll	Cutterbar Anti-clockwise
A	D2	-	Scroll	Cutterbar Clockwise
A	E	-	Press	Cutterbar Start/stop
A	E	F	Press	Cutterbar Reverse Start/stop
A*1	G*1	-	Push Forward*1	VFR Forwards*1
A*1	G*1	-	Pull Back*1	VFR Backwards*1
A*2	H*2	-	Single Press*2	Automatically Levels Cutterbar*2
A*2	H*2	-	Press And Hold For Five Seconds*2	Automatically Levels Cutterbar And Maintains*2

Table 4.3 - Joystick Controls

*1 VFR37 model only

*2 For automatic cutterbar direction guidance see Section 4.1.4.

The joystick is set up for mounting the automatic levelling system. If the customer did not order the levelling system as an option, when first activated the light on the level light key will flash; see Figure 4.2 (H). The light will flash for 5 minutes, then after this first phase the light will finally shut off.

4.1.4 Automatic Cutterbar Direction (option)

The machinery can be equipped with the automatic levelling system. The calibration of the system is done at Spearhead Machinery. Inclinometer operation in service.

Guidance for operating the automatic cutterbar direction can be found in Figure 4.2 (H)/Table 4.3 (H).

If it should be necessary to re-calibrate the inclinometer, we recommend calling local Spearhead dealer or Spearhead Machinery, which will take care of sending the calibration manual.

4.2 Use

4.2.1 General

Once the checks described in Section 1.1 have been performed, the operator proceeds as follows:

- 4.2.1.1 Start the tractor engine and engage the PTO;
- Let the oil circulate for 2 or 3 minutes before operating the control levers. This will prevent a sudden, strong shock to the hydraulic system of the machine which might cause damage.
- 4.2.1.2 Position the cutterbar close to the material to be shredded by moving the relevant control levers in sequence;
- Push the control levers slowly to make sure they are in perfect working order and to check how each function works.
- 4.2.1.3 Push the lever controlling the rotation of the rotor in the desired direction of rotation, lower the cutterbar to the material to be shred and increase the tractor's rpm. After a few seconds the rotor will have reached a stable rotation speed and will therefore be ready to work;

It must be noted that:

- The hedge cutter performs best when the rotor is at its correct operating speed (540 rpm) and the tractor advances slowly;
 - It is advisable to adjust both speeds depending on the type of material to be shred to avoid excessive fuel consumption and the hydraulic fluid overheating;
 - The rotor must rotate only while shredding, and must be deactivated for all other phases by shifting the relative lever into neutral.
- 4.2.1.4 The tractor speed should be chosen depending on the material to be cut and the degree of shredding desired: the recommended speed is between 1 and 4 km/h.



DANGER! Any use other than the one specified is considered improper and Spearhead Machinery shall therefore not be liable for machine breakages or injuries to persons who work in the vicinity.

In the winter let the pumps and the rotor hydraulic motor turn for about 15 minutes before starting work.

In the summer, should the oil temperature exceed 70°, stop the machine and replace the oil with a type which is better suited to high temperatures. Should the problem persist, install an oil cooler on the hedge cutter which is already equipped with a connection for this purpose.

During operation, the operator must follow all the safety rules regarding the use of the machine and take all the precautions described in Section 2.2.3.

When interrupting operation and before stopping the tractor:

- Disengage the rotor rotation by shifting the lever to the "0" position and wait for the rotor to come to a complete stop ;
- Engaging the respective levers, retract the arms - disengage the tractor PTO;
- Turn off the tractor engine, remove the key from the ignition and apply the hand brake. If the tractor is on a slope, insert blocks under the wheels.

At the end of operation, before the tractor is driven back to its usual parking space, secure the hedge cutter in the transport position.

See Section 3.7 for instructions on how to store the hedge cutter.

4.2.2 VFR Model

The VFR model has, in addition to the same functions in the other models, a variable forward reach mechanism that allows the cutterbar to be brought to the operator's side to provide improved visibility of the work area and the direction of operations.

Initially, the operator must move the first arm outwards and then bring the cutterbar towards the front. Before bringing the first arm back to the body, the cutterbar must be moved back into the rear position.



CAUTION! The operator must be very careful while moving the cutterbar to the front not to allow anything to strike parts of the tractor. It is important for the operator to have a thorough understanding of possibly dangerous situations and avoid cutterbar movements that could compromise his/her safety and that of the equipment and tractor.

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5 Maintenance

5.1 Maintenance Instructions

Spearhead Machinery has drawn up a maintenance schedule for the hedge cutter – based on performance tests - which, if performed carefully and regularly by the customer, will guarantee the efficiency and performance of the machine and protect it from any malfunction. The operator responsible for these maintenance operations must be qualified and well-trained. They should not trust their memory but must always read the instructions contained in this manual and follow them to the letter. Before getting out of the tractor and servicing the equipment, apply the handbrake, turn off the engine and remove the ignition key.

Once either maintenance or repair operations have begun, they must be completed and never postponed. For their own safety and in order to prevent damage to the machine, the operator shall display a highly visible sign on the hedge cutter saying “Machine under Maintenance”, prior to beginning any maintenance operation. When using equipment for maintenance and repair operations, all relevant safety rules must be followed.

Only authorised products may be used when servicing the machine and they must not be used inappropriately, for instance: petrol for cleaning or pliers instead of a wrench. Replace broken or worn parts with genuine Spearhead Machinery spares or with parts recommended by Spearhead Machinery. Once the maintenance or repair operations have been completed, clear the area of water, oil, grease, greasy rags, tools and other materials.

The knives are subject to wear and must be replaced regularly depending on the type and frequency of work. When replacing the knives, the machine and the tractor must be turned off and in a safe, stable position; the internal part of the rotor must be visible and clean to ensure replacement in safe conditions. Always order new nuts and bolts together with the knives from a genuine Spearhead Machinery dealer. The operator must use the appropriate personal protective equipment and follow the general rules for safety in the workplace. If there are any anomalies and/or strange noises after the knives have been replaced, please contact your local Spearhead dealer or Spearhead Machinery.



WARNING! All work on the cutterbar must be performed with extreme caution. Before beginning any operation, make sure the rotor (cutterbar shaft) has come to a complete stop. If the cutterbar has been lifted off the ground, it must be propped up with adequate supports for increased safety;



WARNING! Take special care when checking for oil leaks. Oil under pressure can come out of very small and almost invisible holes and can pierce the skin and cause serious infections. Always wear safety glasses with side shields and use a piece of wood or cardboard to establish the origin of the leak;



WARNING! Some parts of the hedge cutter are made of special steel with a high elastic limit. It is therefore forbidden to weld, bore or grind these parts. If necessary, seek advice and authorisation from local Spearhead dealer or Spearhead Machinery who will also provide you with instructions.

5.2 Planned Maintenance

Planned intervention (scheduled maintenance) is strictly indicative and varies in relation to typical conditions of use. Therefore, scheduled maintenance may be varied in relation to type of service, work environment (level of dust), seasonal factors, etc. A greater number of interventions are required for harsher conditions.

5.2.1 Daily Checks

The following check-ups must be performed every day before starting work with the hedge cutter:

- Check that all stickers are in good condition;
- Check the automatic return of all the control levers;
- Check all the hoses are in good condition (no hydraulic oil leaking or oozing out);
- Check the level of the hydraulic oil in both the tank and the pump/gearbox unit;
- Check that all the safety split pins are securely set in the corresponding pins;
- Lubricate all the grease nipples on the hedge cutter using the special pump or apply it with a brush where necessary. Pay particular attention to the lubrication of the cutterbar (necessary every 4 to 5 hours of operation).

- All the grease nipples are easy to locate since they are marked with a sticker with the symbol of a pump;
- Check that all nuts and bolts are tight, paying particular attention to the ones holding the knives.

5.2.2 Monthly Checks Or After 150 Hours Of Operation

The following check-ups must be performed after each month or after every 150 working:

- Check that all stickers are in good condition;
- Check all the hoses are in good condition (all connections tight, protective sleeves in good condition and no hydraulic oil leaking or oozing out);
- Check the level of the hydraulic oil in both the tank and the pump/gearbox unit;
- Clean the hydraulic oil filter;
- Make sure all fastening and safety devices are in good condition and in place;
- Make sure all bolts locking the different parts of the hedge cutter are tight;
- Check the condition of the entire frame of the machine;
- Carry out a performance test on the hedge cutter and listen for suspicious noises.

5.2.3 Annual Checks Or After 1200 Hours Of Operation

The following check-ups must be performed annually or after every 1200 working hours:

- Check all the hoses are in good condition (all connections tight, protective sleeves in good condition and no hydraulic oil is leaking or oozing out);
- Change all the hydraulic oil in the hedge cutter and its oil filter (see paragraph on lubrication when carrying out this operation);
- Check the automatic return of all the control levers and the performance of all the functions;
- Make sure all bolts locking the different parts of the hedge cutter are tight;
- Check the condition of the entire frame of the machine;
- Have a workshop authorised by Spearhead Machinery check the operation and safety of the hydraulic system, as well as checking for suspicious noises.

5.3 Lubrication

5.3.1 Grease Supply Points

Before pumping grease into the corresponding nipples, it is necessary to remove any dust. Then with the help of a special pump, inject the grease. When this operation is complete, wipe the excess grease off with a rag. Use a brush to apply grease if there is no nipple.

Use only the grease recommended by Spearhead Machinery.

All the grease points on the hedge cutter are marked with a sticker as illustrated.

5.3.2 Checking The Oil Level In The Tank (if fitted)

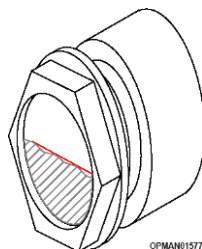


Figure 5.1

All the hydraulic rams on the hedge cutter are double acting; whether they are fully extended or completely retracted, the amount of hydraulic oil in the tank remains practically unaltered.

It is therefore possible to check the oil level at any time. To do this, place the hedge cutter on a flat surface and look through the level cap which is transparent and located behind the tank; see Figure 5.1.

If the oil covers the red mark in the middle of the cap, there is enough oil in the tank. If not, top up the oil following the instructions provided in Section 5.3.4.

5.3.3 Checking The Oil Level In The Gearbox (if fitted)

This operation is the same as the one described in Section 5.3.2. The level cap on the pump/gearbox unit is identical to the one on the tank, only smaller. If the oil covers the red mark in the middle of the cap, there is enough oil in the gearbox; see Figure 5.1. If not, top up the oil following the instructions described in Section 5.3.4.

5.3.4 Topping Up Or Changing The Oil (if fitted)

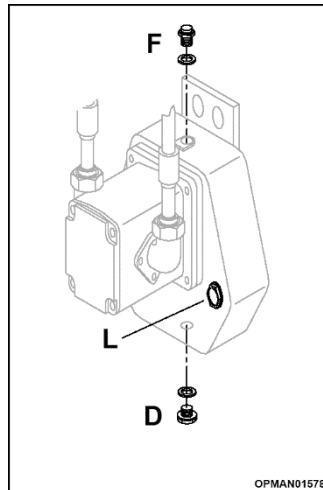


Figure 5.2

Tank (Topping Up)

- To top up, simply remove the filling cap and, with the help of a funnel, pour oil into the tank. Check the level of the oil by looking through the level cap and when it reaches the red mark, stop and screw the cap back on;
- Spearhead Machinery recommends HD 46 or equivalent grade oil.

Tank (Changing The Oil)

- Take a sufficiently large container and place it under the outlet cap of the tank. Unscrew the filling cap and then the outlet cap and let the hydraulic oil drain out completely.
- Replace the gasket on the outlet cap and screw it back into place. Fill the tank with the help of a funnel, using the oil recommended by Spearhead Machinery.
- Check the level of the oil by looking through the level cap and when it reaches the red mark, stop and screw the cap back on.
- Spearhead Machinery recommends HD 46 or equivalent grade oil.

Gearbox (Topping Up)

With reference to Figure 5.2:

- To top up, simply remove the filling cap (F) and, with the help of a funnel, pour oil into the gearbox. Check the level of the oil by looking through the level cap (L) and when it reaches the red mark, stop and screw the cap back on.
- Spearhead Machinery recommends EP80-90/GL-4, GL-5 or equivalent grade oil.

Gearbox (Changing The Oil)

With reference to Figure 5.2:

- Take a small container (holding 3 litres) and place it under the outlet cap of the gearbox (D).
- Unscrew the filling cap (F) and then the outlet cap and let the hydraulic oil drain out completely. Replace the gasket on the outlet cap and screw it back into place. Fill the gearbox with the help of a funnel, using the oil recommended by Spearhead Machinery.
- Check the level of the oil by looking through the level cap (L) and when it reaches the red mark, stop and screw the cap back on.

- Spearhead Machinery recommends EP80-90/GL-4, GL-5 or equivalent grade oil.

When topping up, never mix oils of different types but always use the same type as the one in the tank or gearbox housing; when changing the hydraulic oil, it is possible to use a different brand, provided it has the same characteristics as the one recommended by Spearhead Machinery.



WARNING! To protect the environment and prevent pollution, never dump oil, lubricants, filter cartridges or other hazardous materials. Always comply with the local regulations currently in force regarding the disposal of liquids and solids.

5.3.5 Checking And Replacing The Oil Filter

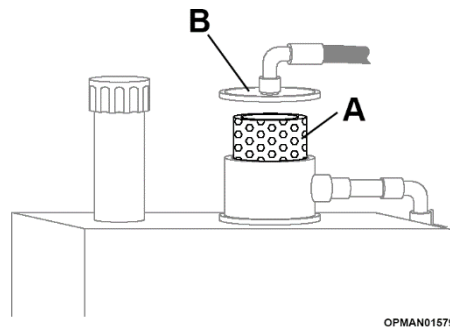


Figure 5.3

With reference to Figure 5.3, the hydraulic oil tank is fitted with a filter cartridge (A) which is designed to clean the fluid inside. The filter cleans the oil when it flows back to the tank. To check the filter, unscrew the screws, remove the lid (B) and pull it out.

If the filter is only slightly dirty, simply clean it by blowing compressed air on it (max. 2 bar); if, on the other hand, it is very dirty, replace it. Only use new filters of the same type.



WARNING! When using compressed air, always protect your eyes by wearing glasses with side shields. Never aim the air at your face or at anyone nearby.

5.4 Troubleshooting

Problems	Causes	Solutions
None of the hedge cutter arms move	The pump/tractor is not delivering oil	Check the pump/tractor is working properly: <ul style="list-style-type: none"> • Check oil delivery using a fluid oil flow meter; • Check pressure with a manometer; • If both tests are positive, the problem is the valve block;
	The hydraulic valve block is not functioning correctly	Check the valve block is working properly: <ul style="list-style-type: none"> • Make sure the hose from the pump is connected properly; • DANGER! – disconnect the discharge hose (not from the valve block side but the opposite side) and make sure the oil flows out with the correct intensity; • If both tests are positive, replace the valve block
	The pressure limiting valve is stuck	Replace the valve
One of the controls does not respond	Oil delivery to and from the hydraulic ram is not correct	Check the pressure of the oil coming out of the hose
	The remote control cable is broken	Replace the cable
	The cursor is broken	Replace the cursor
	The pressure-limiting valve is stuck	Replace the valve
One of the control levers is stuck in one position	The cursor is worn out due to dirt or rust	Replace the cursor
The hydraulic rams move irregularly	There is air in the hydraulic system	Run the machine without any load for a few minutes and use all the hydraulic rams, one at a time, to expel the air from the hydraulic system
The hydraulic ram moves without operating the control lever	The hydraulic ram seals are worn out	Replace the seals
	The valve block seals are worn out	Replace the seals
Irregular cut	Knives worn or broken	Replace the knives
Noises during operation	Insufficient lubrication of the rotor bearings	Lubricate
	Not enough oil in the tank (if applicable)	Top up
	RPM do not comply with the PTO	540 rpm
	Foreign bodies wound around the rotor	Remove the foreign body
	Loose bolts	Identify and tighten
Excessive vibrations	RPM do not comply with the PTO	540 rpm
	Excessive and irregular wear of the knives	Replace all the knives
	Knives broken or deformed	Replace all the knives
	Opposite knives have different weights	Check that the difference in weight is within the 5% tolerance rate

	Rotor bearings broken	Replace the bearings
Arms and joints are too loose	The pins are worn out	Replace the pins
Hydraulic oil overheating (over 80°)	Check the hydraulic system	Get it checked at a specialised workshop

6 Demolition

6.1 Separation Of Waste Material And Disposal

When the hedge cutter is taken out of service, any parts which may be harmful to people or the environment must be properly disposed of.

The following materials, which are part of the machine, must be disposed of separately:

- Steel
- Hydraulic oil
- Rubber
- Plastic
- Conductors in the electric system (optional models)

The disposal of the above materials must be carried out in accordance with the rules in force in each individual country.

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7 Spare Parts

7.1 Genuine Spare Parts



Cost savings associated with the purchase of non-genuine spare parts can be difficult to dismiss, however it is essential to consider the potential safety and longer term performance of the machine and not just the short term financial gains when setting out to repair or refurbish a Spearhead product.

Spearhead Machinery consider all parts not supplied or manufactured by Spearhead Machinery as imitation or copied, it is impossible to guarantee their reliability and they may cause damage to your machine. Genuine Spearhead parts are made to specific standards to give performance and safety. Substitute components may not meet specifications and may fail in a hazardous manner that could cause injury.

Not only can non-genuine spare parts cause damage to the machine, but they may also result in lower performance and invalidate the machine's warranty. To maintain the Spearhead Machinery warranty requires the use of genuine Spearhead Machinery parts.

Spearhead Machinery utilises an interactive parts manual system which uses the machines serial number to give the exact parts required for the that particular machine. Section 7.2 gives guidance on how to use the Spearhead Machinery interactive parts manual system and find correct replacement parts.

It is important to state that **Spearhead Machinery does not sell directly to end users** but instead uses an extensive dealer network to provide to its customer base. Section 7.4 gives guidance to find your nearest Spearhead Machinery dealer.

Purchasing Genuine Spearhead Parts will give you peace of mind that your machines performance won't be compromised and can cost less than you think, so contact your local dealer for a quote before buying non-genuine spare parts.

7.2 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 1.2.

7.2.1.1 Enter the serial number.

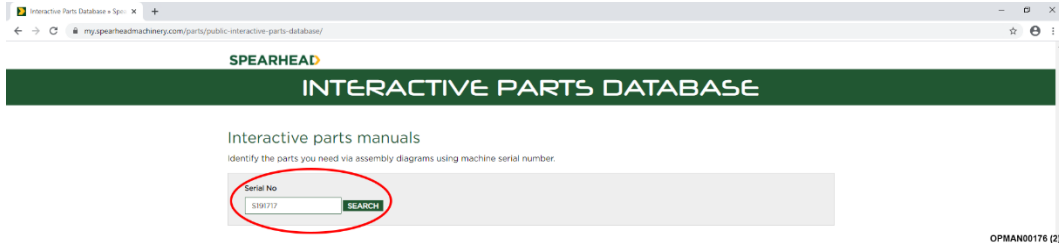


Figure 7.1 – Type In Serial Number

7.2.1.2 After entering the serial number a specification for the machine will appear. Click on the serial number; see Figure 7.2.

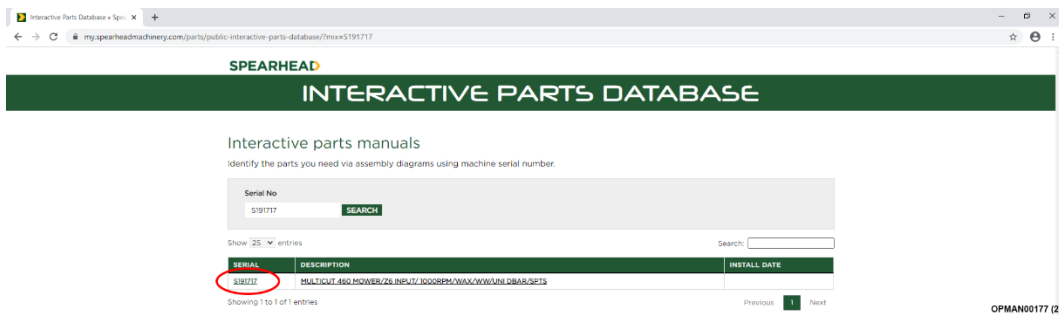


Figure 7.2 – Click On Serial Number

7.2.1.3 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 7.3.

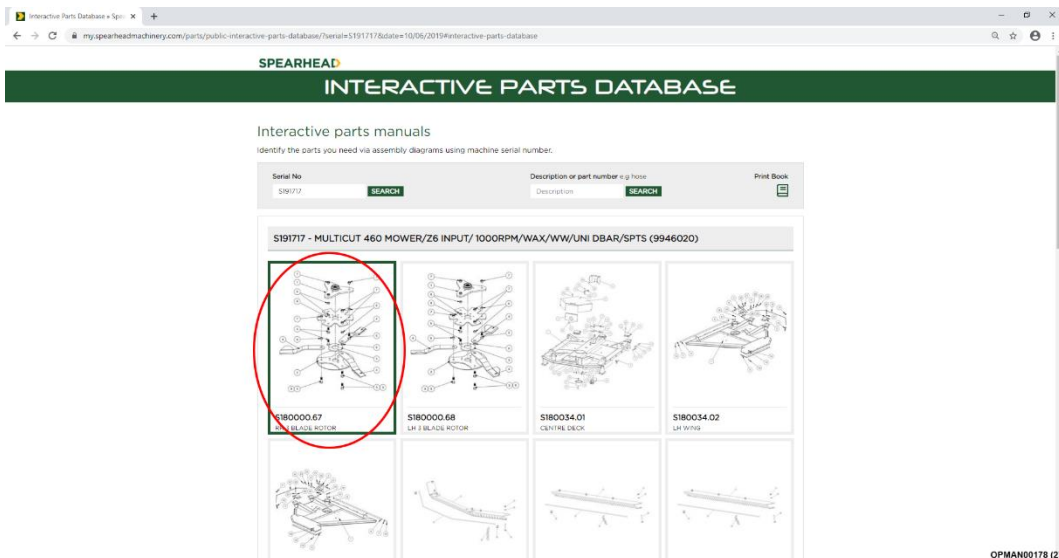


Figure 7.3 – Click On Assembly

- 7.2.1.4 You will finally be presented with a full exploded parts breakdown for that particular assembly, giving part numbers and the quantities required; see Figure 7.4.

The screenshot displays the 'INTERACTIVE PARTS DATABASE' interface. It features a search bar with 'Serial No' and 'Description or part number' fields. Below the search bar is a table titled 'Print Part List and diagram' with the following data:

Ref	Part No	Description	QTY
1	1770602-342	CHIM BLADE CARRIER UPPER (100)	1
2	1770609	LOWER BLADE CARRIER (100)	1
3	1770604-3	SPACER	1
4	7770700	BLADE - RH C/W PIN 25	3
5	277045	BOLT	6
6	7770707	BLADE BUSH	6
7	277044	NUT	6
8	046053	CARRIER	1
9	2770464	WASHER	3

To the right of the table is an exploded view diagram of the assembly, with numbered callouts (1-9) corresponding to the parts in the table. The interface also includes a 'Print Book' button and a 'Serial No' field with the value '59177'.

Figure 7.4 – Exploded Parts Breakdown With Bill Of Materials

7.3 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 7.4.

7.4 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 7.5.

The screenshot shows the 'DEALER LOCATOR' page on the Spearhead website. The search bar contains 'Evesham' and the search radius is set to '25 mi'. The results show 23 dealers. A map of the United Kingdom is displayed, with a green circle indicating the search radius centered on Evesham. The map also shows major cities and countries in Europe.

Figure 7.5 – Dealer Locator

Notes