

# CENTRIFUGALS FERTILISER SPREADER

KC

ORIGINAL MANUAL

**ROCHA**



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# INTRODUCTION

# CHAP1

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By purchasing ROCHA equipment, you have made a truly wise choice and you will quickly realise the remarkable reliability and robustness of our product.

This equipment has been designed and built to high quality standards, in accordance with current regulations and respecting all the required safety levels. We hope that your work will fully meet your expectations.

The purpose of this manual is to enable users of the **Single plate mounted spreaders** to use and handle the equipment safely and effectively.

The advice and standards set out in this manual are intended to maximise the potential of your machine so that you can use it safely and with maximum efficiency.

Any additional information should be obtained from our commercial technical services. Whenever necessary, use the information on the equipment's nameplate to help us identify the characteristics of your machine.

**Only people who have received specific technical training should operate this equipment.**

Make sure you understand the instructions in this manual before you start working with the equipment.

**THIS MANUAL IS AN INTEGRAL PART OF THE MACHINE**

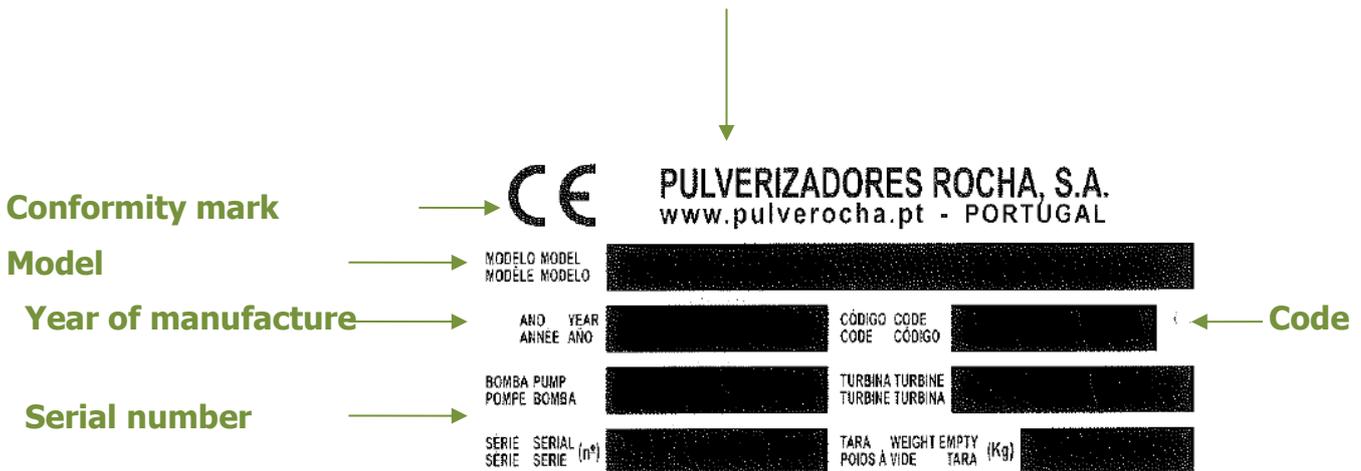


# MACHINE IDENTIFICATION

# CHAP2

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## Manufacturer identification



The identification label placed on the machine chassis contains essential information that is required in order to correctly identify the equipment.

This data must be provided whenever accessories are requested or when technical support is necessary.

# WARRANTY CONDITIONS

# CHAP3

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1. The products sold by PULVERIZADORES ROCHA are submitted to rigorous quality control testing in order to minimize the occurrence of any defects.
2. All equipment is guaranteed for 24 months (NON-PROFESSIONAL USE - DL 67/2003) or 12 months (PROFESSIONAL USE - CC Art. 921) from the date of purchase.
  - 2.1. Any defective components or parts due to manufacturing and /or workmanship defects shall be immediately substituted at no additional cost. However, workmanship and travel costs will be applicable.
  - 2.2. When complaints are submitted, the parts in question must be sent for examination by our Technical Department.
3. The occurrence of any of the facts described below shall result immediately in the invalidity of the warranty:
  - 3.1. The use of the equipment under abnormal work situations or coupled with motors/tractors/hand tractors with power specifications that differ from those recommended in the respective technical documents.
  - 3.2. The substitution of any components or parts by others from 3rd parties.
  - 3.3. Any structural alterations made to the equipment.
  - 3.4. PULVERIZADORES ROCHA are not informed nor give their consent regarding any repairs made during the effective warranty period.

# MACHINE DESCRIPTION

# CHAP4

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**WARNING: Working with agricultural machinery can be dangerous. Incorrect or careless use can result in serious injuries to the operator or third parties!**



**WARNING: It is mandatory to read the user manual carefully before starting any action with the equipment.**

The KC centrifugal spreader was developed with the aim of spreading granular products, mainly chemical fertilisers and seeds, when driven by the tractor's power take-off (PTO). In countries with very cold climates, it is also used for distributing salt on roads to increase road safety. It is therefore a highly versatile machine. Any other application is an inappropriate use.

The dimensions of this equipment are compatible with small and tractors.

The components of this machine are made from a variety of materials, e.g. carbon steel, stainless steel, polyethylene, nylon, among others. The surface treatments applied are galvanisation, passivation and thermoset powder coating, which gives the machine's metal elements high resistance and durability, even in contact with highly corrosive products such as fertilisers.

This equipment has some particularly advantageous features, such as:

- Easy to adapt to agricultural tractors.
- Ease of operation and adjustment.
- Safety and quiet working.



**This machine is designed for spreading granular products (chemical fertilisers and seeds). It is strictly forbidden to use it for any other purpose!**

The following image identifies the main elements of the KC Spreader.

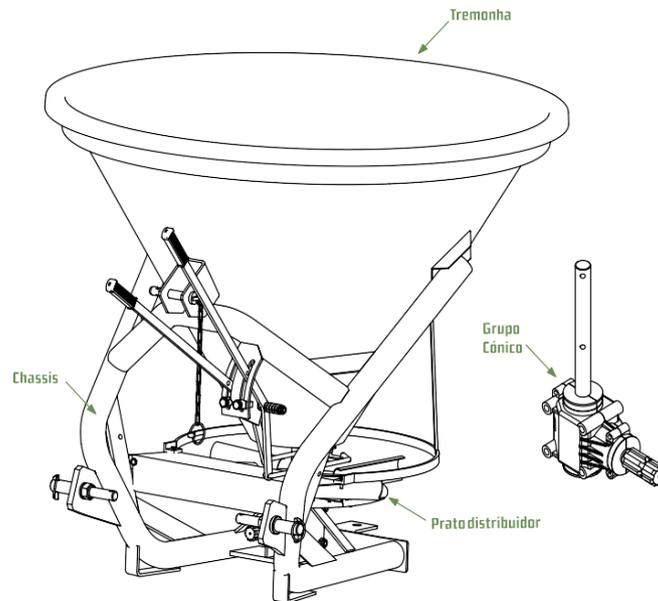


Figure 4.1 - KC fertiliser spreader

The centrifugal fertiliser spreader consists of a machine containing a spreader plate.

It is a machine that works connected to the three points of the tractor, type I or II.

Although it is an implement that requires little drive power, given the weight of fertiliser placed in the hopper, the installation of front weights or the use of higher-powered tractors may be necessary.

Due to the different densities of products, its chassis has been dimensioned taking into account the highest of them.

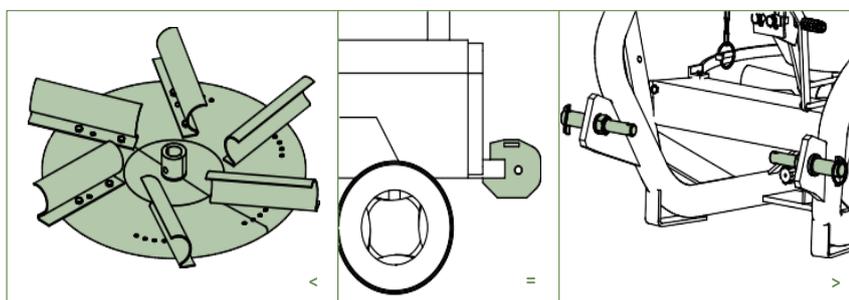


Figure 4.2 - Spreader plate, tractor ballast and 3-point coupling

It is possible to distribute either to the right or to the left of the tractor, simply by operating one of the two levers for opening the fertiliser discharge.

All fertiliser spreaders are equipped with a trailer hitch that will reduce transport costs when the land to be fertilised is far from the storage site.

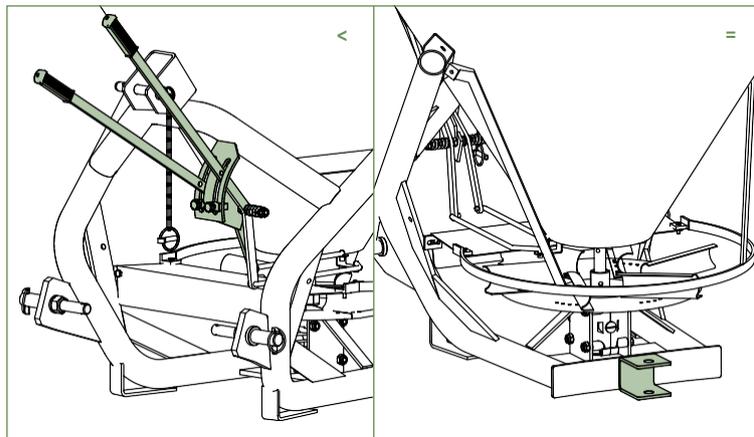
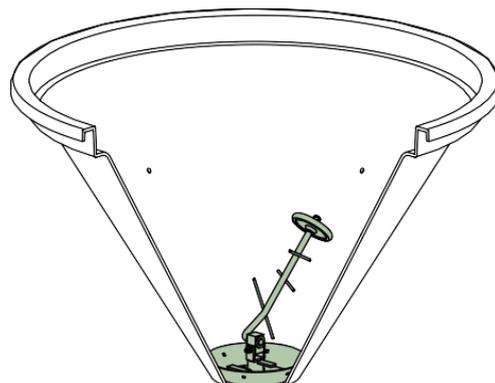


Figure 4.3 - Fertiliser discharge opening levers and trailer hitch

For working with limestone and powdered fertilisers, an agitator has been specially designed which, due to its shape, will force the fertiliser to settle on the discharge plate. As this plate is in direct contact with the fertiliser, it has been specially made from AISI 316 stainless steel.



 **ATTENTION!**  
Do not use the agitator with granulated fertilisers.

Figure 4.3 - Limestone agitator

The following table shows the main technical characteristics of the KC Spreader.

|                                     |  |
|-------------------------------------|--|
| <b>Volumetric capacity</b>          | (*) 250 - 500 litres                         |
| <b>Load capacity</b>                | (*) 268 - 535 kg (fertiliser density 1.07)   |
| <b>Weight</b>                       | (*) 73 - 89 kg                               |
| <b>Height</b>                       | (*) 1010 - 1280 mm                           |
| <b>Width</b>                        | 1010 - 1260 mm                               |
| <b>Length</b>                       | -  |
| <b>Coupling system</b>              | At 3 points (type I and II)                  |
| <b>Input speed (PTO)</b>            | 540 rpm                                      |
| <b>Mechanical Transmission Unit</b> | Bevelled gearbox,<br>1:1 transmission ratio. |

Table 4.1 - KC technical characteristics

(\*) Prices vary depending on the optional posture that can be fitted

This fertiliser spreader has a spreading plate with six steel vanes. The mounting and arrangement of the vanes on the plates depends on the type of product to be spread and the desired range (see spreading tables).

The amount of spreading is adjusted manually by positioning two levers, one for each mouth of the hopper bottom. Hopper bottom in AISI 316 stainless steel. The positioning of the levers is determined according to the desired working conditions.

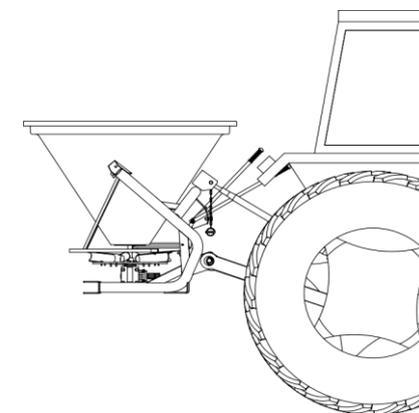


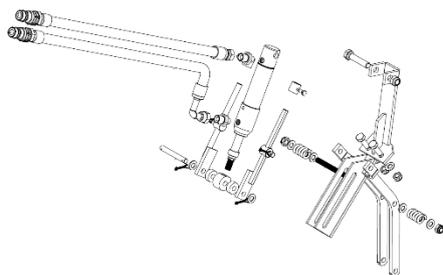
Figure 4.4 - Dosing mechanism

**OPTIONAL ACCESSORIES:**

The **KC Spreader** can be equipped with the following optional accessories:

- **HYDRAULIC OPENING**

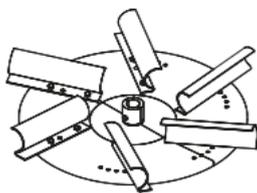
The hydraulic opening for KC makes it easier for the operator to open and close the dosing nozzles.



*Figure 4.5 - Hydraulic opening*

- **STAINLESS STEEL SPREADING PLATE**

The stainless-steel spreading plate for KC is an asset in maintaining the useful life of one of the spreader components that constantly comes into contact with the fertiliser.



*Figure 4.5 - Stainless steel spreader plate with 6 vanes*

- **COVERAGE CLOTH**

The coverage cloth for KC protects the fertiliser and seeds inside the hopper from moisture and dirt.



*Figure 4.6 - Coverage cloth*

- **SALT APPLICATION LIMITER**

The salt application limiter for KC allows salt to be applied normally on roads in order to increase road safety.



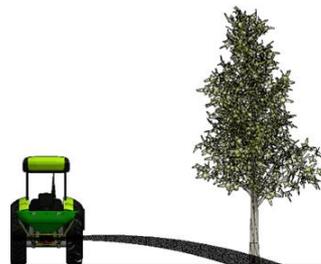
*Figure 4.7 - Salt application limiter*

- **LATERAL 1 OUTLET LOCATOR**

The Lateral 1 outlet Locator for KC makes it possible to locate the fertiliser in a side row, vineyard row or orchard for example.



*Figure 4.8 - Lateral 1 outlet Locator*



*Figure 4.9 - Fertilisation in the row*

# INSTALLATION AND CONNECTION TO THE TRACTOR

## CHAP5



**WARNING: It is mandatory to read the user manual carefully before starting any action with the machine.**



**WARNING: Coupling manoeuvres of agricultural machinery to tractors is dangerous! Make sure you comply with all safety rules.**

In order to facilitate and protect the equipment, some accessories may be supplied disassembled from the machine. This is also why it is important to read and understand this user manual, which should be delivered with the machine. The user manual explains how to proceed when assembling these accessories.



**WARNING: When manoeuvring to connect the machine to the tractor, it is mandatory to wear suitable protective equipment!**

After receiving the equipment and before carrying out any operation, pay attention to the following:

- Check that the hopper of the spreader is clean, with no foreign objects inside. If not, remove it;
- Check that the tractor to be used is suitable (e.g. braking system, stability, power, load capacity and total weight);
- The KC Spreader is coupled to the tractor via the hydraulic system's 3-point mechanism,
- Make sure that the tractor's hydraulic system is able to safely lift the loaded spreader.



**WARNING: Never stand under the equipment while it is suspended.**

**Working with agricultural implements involves risks.** Therefore, before starting work on coupling the KC and after carefully reading and understanding this user manual, we recommend that you carry out the following procedure calculating maximum admissible loads and take the appropriate action to ensure your safety and that of third parties.

| LETTER   | DESCRIPTION   | UNIT |
|----------|---|------|
| <b>A</b> | Tractor tare weight without the machine attached (1)  | Kg   |
| <b>B</b> | Weight on the tractor's front axle without the machine attached (1)   | Kg   |
| <b>C</b> | Weight on the rear axle of the tractor without the machine attached (1)                                     | Kg   |
| <b>D</b> | Total weight of the machine or front-mounted counterweights   | Kg   |
| <b>E</b> | Total weight of the machine or the counterweights attached to the rear                                      | Kg   |
| <b>f</b> | Distance between the centre of the machine or counterweights and the front axle centre                      | m    |
| <b>g</b> | Tractor wheelbase   | m    |
| <b>h</b> | Distance between the centre of the rear axle and the point of lever arm coupling                            | m    |
| <b>i</b> | Distance between the centre of the machine or counterweights and the centre of lever arm coupling point (2) | m    |

(1) Take into account accessories or the weight of water on the tyres.

(2) If there are no indications, calculate  $i =$  half the length of the machine.

\* Consult the tractor's user manual for the necessary data

\*\* Consult the tyre manufacturer for the necessary technical information.

\*\*\* The data relating to the spreader is given in this user manual (table 4.1. page 8).

Table 5.1 - Data for calculating maximum admissible loads

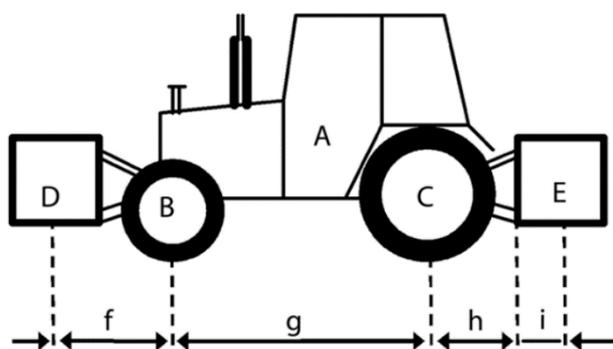


Figure 5.1 - Diagram for calculating maximum admissible loads



**NOTICE:**  
**Incorrect or careless use of agricultural machinery can result in very serious injuries to the operator or third parties!**

**CALCULATIONS:**

- **Total weight (kg) =  $A + D + E$**

The total weight must not exceed the maximum admissible weight.

- **Axial load of the front axle (kg) =  $\frac{D * (f + g) + (B + g) - E * (h + i)}{g}$**

The axial load of the front axle must not exceed its maximum admissible load.

- **Axial load of the rear axle (kg) =  $Total\ weight - Axle\ load\ of\ the\ front\ axle$**

The axial load of the rear axle must not exceed its maximum admissible load.

The minimum load on the tractor's front axle must be 20% of its tare weight.

In this case, bearing in mind that the machine will be hooked up to the rear 3-point hydraulic mechanism, you should calculate the minimum counterweight required (in kg) to be mounted on the front of the tractor as follows:

- **Front counterweight (kg) =  $\frac{E * (h + i) - (B + g) + (0,2 * A * g)}{F + g}$**

If the result is negative, there is no need to mount extra counterweights on the front of the tractor.

**Important:**

- Make sure you work within the limit values indicated by the tractor manufacturer.
- After installation, make sure that the actual loads on the axles are less than the maximum loads allowed on each axle (front and rear).
- If you have a scale suitable for weighing vehicles at your disposal, use it to determine the total weight of the tractor and attached equipment and the loads on the front and rear axles.



**WARNING: Once loaded, at least 20% of the tractor's total weight must be supported by the front axle and 45% by the rear axle. This ensures safe spreading of the loads!**



**WARNING: Hitching and unhitching agricultural machinery carries a risk of injury and can cause serious injury!**



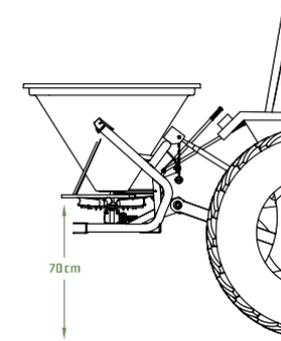
**WARNING: This equipment includes elements that can cause cuts and/or crushing. The use of suitable protective equipment is mandatory!**

In order to reduce the risk of accidents **during the manoeuvres for coupling and uncoupling** the machine to the agricultural tractor, take the following instructions into account:

- Make sure the tractor is braked (parking brake);
- Check that the electrical, mechanical and hydraulic elements of the tractor and implement are in good working order;
- Carry out coupling and uncoupling operations on stable, dry and level surfaces so that the machine does not risk tipping over or sliding out of control;
- Make sure that other people and animals are not in the danger zone during the work;
- Do not stand between the tractor and the machine during coupling and uncoupling operations;
- Only engage the machine at the points provided for this purpose;
- Only engage and disengage the machine when the PTO shaft is stationary;
- Operate in accordance with the procedures described in this user manual;
- Attach the KC Spreader to the hydraulic system's 3-point mechanism by first hooking it to the lifting arms (2nd point) and only then to the 3rd hooking point;
- Adjust the lift arm stabilisers so that the machine is centred in relation to the width of the tractor,
- Adjust the working height of the KC Spreader, taking as a reference the distance between the ground and the spreading plate (*Figure 5.2*). After adjusting this dimension (70 cm), you must now level the machine in relation to the ground (*Figure 5.2*).



**Important: Position the spreader high and level with the ground.**



*Figure 5.2 - Example of setting the machine in the working position.*

**NOTE: The cardan shaft supplied with the spreader is too long for most tractors.**

Note that during the machine's up and down movements, the inner and outer shafts of the cardan must slide freely relative to each other. At the same time, you must ensure that the overlap of the shafts is sufficient for safe and effective power transmission in any position, especially when the working angle is more unfavourable (*Figure 5.4*).



**WARNING: Incorrect mounting of the cardan shaft can cause serious injury to the operator and damage to the implement or tractor!**

To adjust the **length of the cardan shaft** correctly, proceed as follows:

- Raise the machine with the 3-point hydraulic mechanism until the PTO shaft and the implement shaft are at the same height (the position where the cardan shaft will be shortest);
- If possible, support the machine on a stand;
- Switch off the tractor and remove the key from the ignition;
- Brake the tractor properly (parking brake);

- Slide the inner and outer shafts of the cardan shaft until they disengage completely;
- Mount the tractor-side cardan half onto the tractor's PTO shaft;
- Mount the cardan half on the implement side onto the implement shaft,
- Use your hands to place both ends of the cardan shaft parallel to each other, as shown in the following figure.

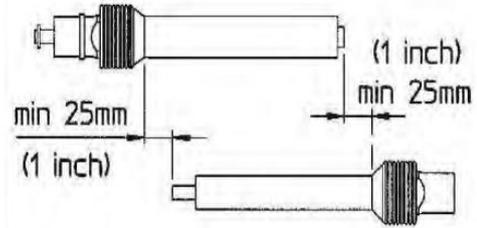
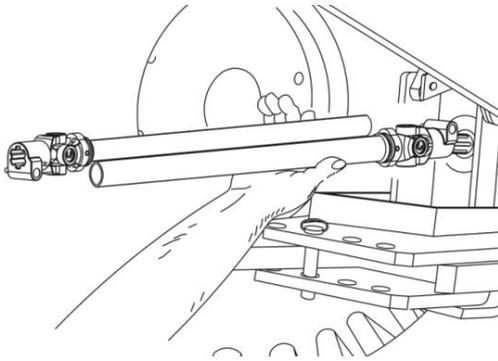


Figure 5.3 - Ex. adjusting the length of the cardan shaft

**Note:** The cardan shafts should overlap as much as possible, with a minimum of 150mm. At the ends, the shafts should have approximately 25mm of clearance when the PTO shaft and the implement shaft are at the same height (*Figure 5.3*).

Cut the shafts enough so that the gap is approximately 25mm;

Cut the plastic protection at the same distance;

Remove any burrs from the edges;

Fit the shaft halves together;

Couple the complete cardan shaft to the machine and tractor;

Check that the safety pins on the cardan shaft have been properly engaged,

Raise the machine to the highest working point.

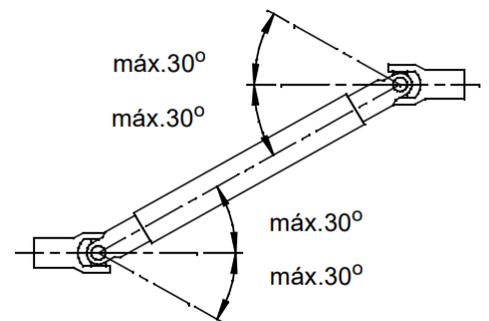


Figure 5.4 - Ex. maximum working angle of the cardan shaft

The maximum working angle allowed for the cardan shaft is 30° on each side (*Figure 5.4*), taking the PTO shaft and the implement shaft as references.

This is the greatest admissible distance between the PTO shaft and the machine shaft.

To check the correct dimensions, proceed as follows:

- Raise the machine to its highest position;
- If possible, support the machine on a stand;
- Switch off the tractor and remove the key from the ignition;
- Brake the tractor properly (parking brake);
- Check that the angle of the cardan shaft is less than 30°;
- Check that the inner and outer shafts of the cardan shaft are at least 150mm apart;
- Loosen the cardan shaft on the tractor side and disengage it completely;
- Apply lubricant to the entire surface;
- Reassemble the cardan shaft on the tractor, without forgetting the protective plastic tubes;
- Check that the safety pins on the cardan shaft have been properly engaged;
- Attach the safety chains to the cardan shaft,
- Properly attach the chains to a fixed point on the tractor and machine respectively



**WARNING: Always attach the safety chains to the plastic protection tubes. Once the protection tubes are rotating, they can wrap around other elements and cause injury to the operator and/or damage to the equipment.**



**WARNING: Incorrect mounting of the cardan shaft can cause serious injury to the operator and damage to the implement or tractor!**

# INTENDED USE OF THE MACHINE

# CHAP6

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## SETTING THE MACHINE TO WORK:

Before starting work with the spreader, you must take into account all the safety aspects applicable to this type of equipment. Read this user manual carefully, in particular **CHAP 7** (*safety warnings and accident prevention*).



**WARNING: Adjustment and fine-tuning must be carried out exclusively by the operator, whenever possible with the tractor switched off and the key removed from the ignition.**



**WARNING: This machine may only be manoeuvred by qualified operators! Make sure that no-one is near the equipment during adjustment and operation.**

As the distribution range of fertiliser depends on various factors, such as its granulometry, density and degree of humidity, it is difficult to predict what range the fertiliser spreader will have. However, by carrying out a small test we can check the range that will be obtained, and from there, by consulting the accompanying abacus, fine-tune the machine to obtain the desired dosage.

To ensure that the product is applied correctly, make sure that the PTO speed is constant during work. On most tractors, the standardised PTO speeds are indicated on the tachometer. Some tractors have a specific tachometer for this parameter.

If in doubt about the PTO speed setting, consult the tractor's user manual or use a portable rev counter (*Figure 6.1*) to check the output speed.

**IMPORTANT: For correct spreading it is important to keep the PTO speed constant during work!**



*Figure 6.1 - Rotation counter example*

• **Dosage calculation:**

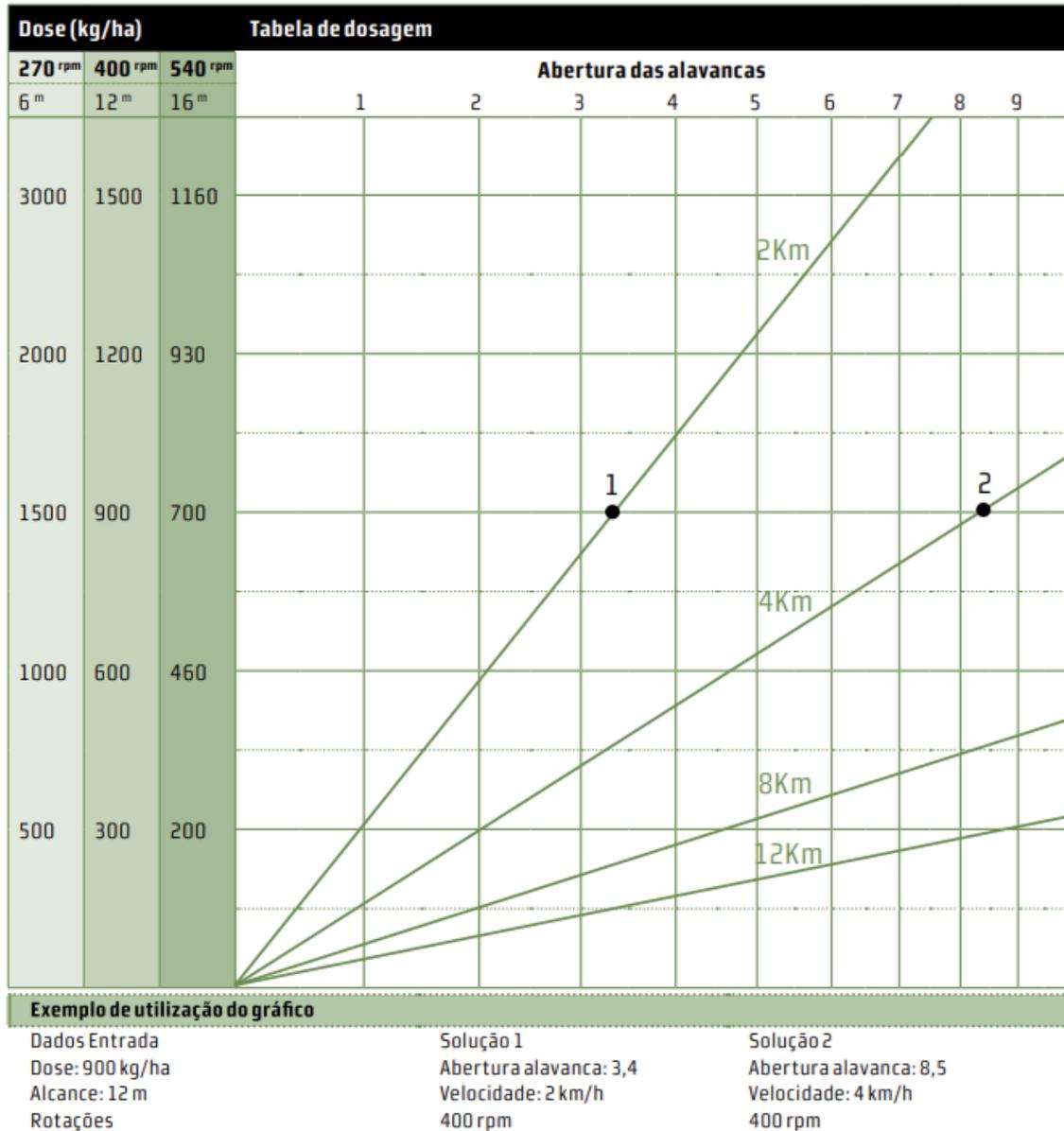


Figure 6.2 - Spreading Abacus example

In the example on the abacus, for a reach of 12 metres and a dosage of 900 kg/ha, there are two possible solutions.

The first points to a tractor speed of 2 km/h and a lever opening setting of 3.2. The second, which will save time and fuel, with the lever openings set to 8.2, the tractor speed should be 4 km/h.

The dosage can be calculated by consulting the abacus or as follows:

Example1:

We plan to apply 150 kg of fertiliser per hectare.

For our calculation, it is essential to know the quantity to be applied per minute. 150 kg = 150,000 g

$$\frac{150.000}{10.000} = 15\text{g/m}^2$$

1 hectare = 10,000 m<sup>2</sup>

Knowing that the tractor's speed is 6 km/h, we conclude that we do 100m per minute

6km-1h

6000m - 60min

100m - 1min

After a short test, we found that the working width is equal to 10 metres.

We then conclude that in one minute we will cover the following area: 100m x 10m = 1000m<sup>2</sup>

Therefore: 1000m<sup>2</sup> x 15g/m<sup>2</sup> = 15,000g <=> 15kg/min

With this information we can now adjust the fertiliser output as follows:

1. Dismantle the spreader plate
2. Place a container under the hopper outlets
3. Act on the dosing levers, lowering them at the same time to a certain position, thus causing the two outlets to open and the fertiliser to fall.
4. Make as many attempts as necessary until you achieve an output of 15 kg of fertiliser per minute.



**WARNING: Adjustment and fine-tuning must be carried out exclusively by the operator, always with the tractor switched off and the key removed from the ignition.**

- **CONTACT WITH CHEMICAL PRODUCTS:**

During filling, adjustments or testing, you may come into contact with fertiliser or other chemical substances. If this is the case, wear suitable protective clothing, gloves, a mask and footwear. Contact with chemicals can cause serious bodily injury.



**WARNING: Avoid contact with fertiliser or other chemical substances!**



**WARNING: Before handling the chemicals to be spread, carefully read the product information sheet that should be available to you from the product supplier!**

- **HOMOGENEOUS DISTRIBUTION:**



As the amount of fertiliser distributed decreases as you move away from the tractor axle, in order to achieve the most uniform distribution possible, the tractor should pass again at the limit of the distribution range, as shown in the figure.

**IMPORTANT: The overlapping is done to even out the concentration of product over the entire working surface!**

# SAFETY WARNINGS AND ACCIDENT PREVENTION

## CHAP7

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The safety of operators or other people and animals exposed to the operation of this equipment is our main concern.

A significant proportion of the accidents recorded in the use of machinery and equipment are due to non-compliance with basic safety, regulation and equipment handling rules.



**WARNING: It is mandatory to read the user manual carefully before starting any operation with this equipment.**



**WARNING: This machine may only be manoeuvred by qualified operators! Make sure that no-one is near the equipment during adjustment and operation.**

This manual has been developed with the aim of guaranteeing safe and effective actions related to the operation and handling of Centrifugal Spreaders.

Make sure you have the necessary knowledge to operate the spreaders and the tractor from which you are going to manoeuvre the implement. Information on agricultural tractors should be consulted in the respective user manual or by the tractor manufacturer.

**It is the operator's responsibility to read**, understand and comply with all the safety actions described in this manual before starting to work with the spreader. If you have any questions, please contact our technical and commercial services.

Remember, you are the key to safety. Good practices not only protect you, but also the people around you. Study the guidelines described in this manual and make them an integral part of your safety programme.

Please note that this safety section is exclusive to this type of machine (Centrifugal Spreader). Follow all the safety recommendations described in this manual and keep them in mind at all times:

**SAFETY IS YOUR RESPONSIBILITY, ASSERTIVENESS OF YOUR ACTIONS CAN PREVENT SERIOUS ACCIDENTS!**

The following information is intended to alert the operator to **prohibitions, dangers and requirements**, as well as other important safety when using Centrifugal Spreaders.



It is forbidden to go near equipment that is in operation.



It is forbidden to leave the equipment with the ignition key in the tractor.



It is forbidden to bring flames or hot objects close to hydraulic components.



It is forbidden to carry out any maintenance while the equipment is in operation.



It is forbidden for individuals under the influence of alcoholic beverages or narcotics to operate this equipment.



Danger! Keep a safe distance from the spreader when it is suspended during loading and unloading manoeuvres.



Danger! The spreader can cause serious cuts.



Danger! The spreader can crush limbs.



Danger! The spreader projects fragments. Do not let people or animals near the equipment while it is running



Danger! The hydraulic pressure in the equipment must not exceed 200 bar.



The use of personal protective gloves is compulsory.



It is compulsory to wear personal protective footwear.



It is compulsory to wear a personal protective mask with a suitable filter.

**OTHER IMPORTANT WARNINGS:**

- Don't wear loose clothing, jewellery or other items that could get caught in the machine. If necessary, secure your hair properly.
- Switch off the tractor and remove the ignition key before carrying out any work.
- If the tractor does not have an enclosed cab, take appropriate protective measures using personal protection against dust and debris projection.
- The use of this equipment by operators who are not in good health is prohibited.
- Always wear the personal protective equipment required by law, such as ear protectors, goggles, gloves, masks, safety footwear, etc.
- Respect the environmental rules for the use of lubricants and/or other cleaning and maintenance products.
- Always have first aid equipment at hand.
- If you notice abnormal vibrations while using the equipment, stop immediately, switch off the equipment and the tractor and check the cause(s). Do not work with the equipment again until the problem has been resolved.
- Never operate the equipment if you detect leaks in the hydraulic elements.
- Drive carefully on uneven ground.
- Carry out a risk analysis of the workplace before any operation. Check if there are any obstacles that you need to pay special attention to (trees, walls, electricity or media poles, etc.).
- Never approach or allow to approach the machine when it is switched on, there is a great risk of being hit by the plates or projections.
- Before switching on the spreader plates, make sure that no one is near the machine.

# CHECKING AND MAINTENANCE

# CHAP8

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The use of machinery requires certain procedures to be taken into account, not only during operation, but also when **checking** and **maintaining** the equipment. **These actions must be carried out with rigour** because they directly affect the performance and durability of the equipment and the safety of the operators.

When carrying out checking and/or maintenance work, you should be aware of any hazards that may arise during these operations. This work must be carried out by qualified personnel. **Please note the following warnings.**

- **SAFETY WARNINGS**



Before carrying out any cleaning or maintenance work, switch off the tractor's engine and wait until all moving parts in the spreader have stopped. Remove the key from the ignition!



All **repair work** must be carried out exclusively in **specialised workshops**.



Welding, electrical and hydraulic work may only be carried out by specialised technicians.



Do not make any changes to the equipment's electrical or hydraulic circuits.



Centrifugal spreaders have cutting elements. Whenever possible, the cutting elements should be **protected** to avoid accidents.



All maintenance work must be carried out by trained personnel.



**The use of appropriate protective equipment is mandatory for any maintenance work.**



Spare parts must at least fulfil the technical requirements laid down by the manufacturer. This is guaranteed if you **only use original parts**.



Make sure that maintenance and cleaning work is carried out under the appropriate safety conditions.

• **GENERAL MAINTENANCE - FREQUENCY**

Carry out a general check of your spreader and any adjustments at the end of each working day (gaps, oil leaks, lack of lubrication, noises, foreign bodies, etc.). The frequency of other checks and maintenance must be carried out in accordance with the indications in the following table.

**Note:** Most of the spreader components are secured with self-locking nuts. **For safety reasons, do not re-use self-locking nuts.**



**WARNING: THE SPREADERS MUST BE CHECKED OR SERVICED WHEN THE TRACTOR IS STATIONARY AND WITHOUT THE KEY IN THE IGNITION.**

| POINTS TO CHECK   | DAILY | WEEKLY | ANNUALLY |
|---|-------|--------|----------|
| LEAKS IN THE OIL-HYDRAULIC CIRCUIT  | X     |        |          |
| GENERAL STRUCTURAL INTEGRITY  | X     |        |          |
| FOREIGN BODIES (clods, debris, stones, etc.) INSIDE THE TRAIN             | X     |        |          |
| GENERAL CONDITION OF THE PLATE AND VANES                                  | X     |        |          |
| GENERAL CONDITION OF THE AGITATOR   | X     |        |          |
| CARDAN (state of repair and lubrication)                                  | X     |        |          |
| SCREWING  |       | X      |          |
| TRANSMISSION MECHANICAL UNIT (noises; gaps; leaks, etc....)               |       | X      |          |
| ANGULAR GROUP VESSEL AND CASK (pour oil through the inside of the hopper) |       | X      |          |
| GENERAL CLEANING  |       | X      |          |
| SPRINGTOOTH NET   |       | X      |          |
| WEAR ELEMENTS   |       |        | X        |

Table 8.1 - Checks to be carried out - frequency

| ACTION TO BE TAKEN  | DAILY | WEEKLY | ANNUALLY |
|---|-------|--------|----------|
| LUBRICATION   | X     |        |          |
| CLEANING THE EQUIPMENT  | X     | X      |          |
| REPLACE LUBRICANT IN THE MECHANICAL TRANSMISSION UNIT HOUSING |       |        | X        |
| FITTING REPLACEMENT (if necessary)                            |       |        | X        |
| AGITATOR REPLACEMENT (if necessary)                           |       |        | X        |

Table 8.2 - Preventive maintenance - frequency

Maintenance must be carried out at the defined intervals or whenever justified.

Pay attention to the procedures described below. These procedures are intended to help you carry out maintenance work on your spreader in the most correct, safe and effective way.

- **Screws:** It is very important that you **check the tightness of nuts and bolts 8 hours after first using the machine**. Some components may need to be readjusted.
- **Leaks in the hydraulic circuit:** Whenever you detect a leak in any component of the oil-hydraulic circuit, you should immediately have the damaged element repaired or even replaced. Oil leaks cause the equipment to lose efficiency and can lead to other serious malfunctions in the machine.  
Hydraulic oil spills contribute severely to environmental pollution.
- **General integrity of the machine frame:** Make sure that the machine frame and its optional equipment are in good condition.
- **Foreign bodies in the machine:** Remove any debris that sometimes accumulates at the bottom of the hopper, near the de-airing nets or even near the agitators. These bodies can cause blockages and thus reduce the dose of product to be spread.
- **Plate and vanes:** Check the state of repair of the spreader's plate and vanes every day. If any of these elements show obvious signs of wear or damage, they should be replaced.
- **Agitator:** Check the state of repair of the Agitator regularly.
- **Cardan shaft:** The cardan shaft (*Figure 8.2*) is one of the components you should check every day you work on the machine and, in this particular case, lubricate properly at the same intervals.
  - **Inspection:** Check the general operation of the cardan shaft. If you detect anything strange (noise and/or vibrations), stop the machine safely and check the anomaly. Correct the problem before putting it back into operation.
  - **Lubrication:** The cardan shaft should be lubricated daily with **NLGI class 1-4** grease

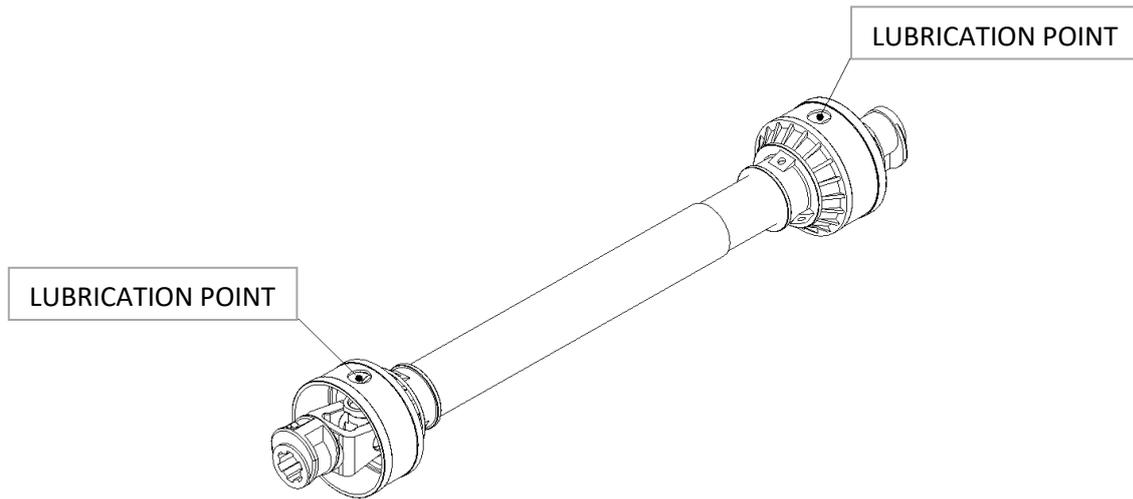


Figure 8.2 - Example of a transmission cardan shaft

To lubricate the points indicated, use a lubrication pump identical to the one in the following figure (Figure 8.3).



Figure 8.3 - Example of a lubrication pump

- **Mechanical Transmission Unit:** Check the condition of this vital machine element carefully.
  - **Inspection:** If you detect noises, looseness or lubricant leaks, you must immediately stop the machine safely and identify their source. Have the damaged component(s) repaired or replaced if necessary.
  - **Lubrication:** Under normal working conditions, gearboxes do not require lubricant replacement. However, we recommend replacing it after 3000 hours of work. This interval should be halved if the spreader is subjected to intensive work and under severe conditions of fertiliser dust and/or frequent water jets (machine cleaning operations).

**Important:** The lubricant to be applied to the box must be SAE 140 HIPOID.



**WARNING: REMOVE OIL IN AN ENVIRONMENTALLY FRIENDLY MANNER. FIND OUT ABOUT THE REGULATIONS IN FORCE!**

- **Springtooth nets:**

- As already explained, the dethatching mesh prevents foreign bodies from passing through to the fertiliser dosing mechanism. Make sure they are in good condition.

- **General cleaning:**

Most of the products to be spread, particularly fertilisers, are highly corrosive and can therefore cause oxidation in some of the machine's components. This is why cleaning the spreader is very important for its preservation.

- If possible, clean with air;
- If necessary, rinse the fertiliser dosing mechanism properly.
- If washing at high pressure, do not direct the water jet at the machine's electrical and hydraulic elements or at the machine's stickers.
- After washing and drying the equipment, protect the stainless-steel metal elements with an environmentally friendly anti-corrosive agent.

# MALFUNCTION PROCEDURE

# CHAP9

When handling spreaders, abnormal situations may arise that interfere with their correct operation or prevent them from working. The following table lists the most common situations and how to solve them.

| MALFUNCTION                                      | CAUSE  | SOLUTION   |
|--|--|--|
| <p><b>Product spreading is not uniform.</b></p>  | <ul style="list-style-type: none"> <li>- Obstruction of the dosing plate;</li> <li>- The position of the scale is not correct;</li> <li>- Improperly fitted spreader vanes;</li> <li>- PTO rotation not suitable,</li> <li>- The spreader is not levelled;</li> <li>- Misinterpretation of the spreading abacus;</li> <li>- The agitator is grinding the product.</li> </ul> | <ul style="list-style-type: none"> <li>- Unclog the measuring dish;</li> <li>- Check and adjust the position of the scale;</li> <li>- Confirm the assembly instructions;</li> <li>- Adjust the PTO speed,</li> <li>- Level the spreader as indicated in this manual;</li> <li>- Analyse the spreading abacus correctly;</li> <li>- Check whether it should be used and check its condition, replacing it if necessary</li> </ul> |
| <p><b>Excess product during application.</b></p> | <ul style="list-style-type: none"> <li>- The product is of poor quality (soft, broken, several types mixed together);</li> <li>- The number of revolutions of the spreader plate is very high;</li> <li>- The tractor's speed is slow.</li> </ul>  | <ul style="list-style-type: none"> <li>- Check the granulometry of the product;</li> <li>- Adjust the PTO speed;</li> <li>- Adjust the tractor speed.</li> </ul>   |
| <p><b>Product during application.</b></p>        | <ul style="list-style-type: none"> <li>- Poor grain quality. 80% of the grains must have a diameter between 2.0 and 4.75 mm;</li> <li>- Incorrect interpretation of the abacus;</li> <li>- Check the working width.</li> </ul>   | <ul style="list-style-type: none"> <li>- Check the granulometry of the product;</li> <li>- Check the Abacus data;</li> <li>- Work with less range.</li> </ul>  |

| MALFUNCTION                                  | CAUSE  | SOLUTION  |
|--|--|---|
| <p><b>Vibrations or excessive noise.</b></p> | <ul style="list-style-type: none"> <li>- Looseness in the cardan crossheads due to excessive wear;</li> <li>- The assembly of the cardan shaft is not correct;</li> <li>- Excessive play in the tractor arms;</li> <li>- The spreader plate is damaged;</li> <li>- The agitator is damaged;</li> <li>- The Mechanical Transmission Unit is damaged.</li> </ul> | <ul style="list-style-type: none"> <li>- Replace the crossheads according to the instructions in the Cardan user manual;</li> <li>- Check the length and working angle of the cardan shaft.</li> <li>- Stabilise the tractor arms, keeping the machine centred;</li> <li>- Check the spreader plate or replace it if in doubt;</li> <li>- Replace the agitator,</li> <li>- Check the condition of the mechanical transmission unit; Check the lubricant level; If the problem persists, contact your supplier.</li> </ul> |

# TRANSPORT, HANDLING AND STORAGE

## CHAP10

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Transporting or moving the KC Spreader when it is not attached to the tractor requires certain precautions. **Before transporting the machine, pay attention to the following warnings.**

### 1. SAFETY WARNINGS



All work must be carried out by properly trained and authorised personnel.



Use appropriate means of transport and lifting devices that comply with the rules and are in good condition.



Before selecting the transport devices, check the weight of the machine. The exact weight of each model is engraved on the machine's nameplate.



Determine the transport route in advance and eliminate possible obstacles.



Check that all the devices to be used are operational.



Secure all devices that could cause danger, even if they are only in use for a short period of time.



Always move empty equipment with care.



Ensure the stability of the machine during handling or transport. If necessary, adjust the length of the cables or straps to ensure the stability of the machine.



Transport the machine as close to the ground as possible.



Land the machine carefully on the loading platform of the transport vehicle or on firm ground.

## **2. STORAGE**

Once the application is complete, the equipment should be cleaned and lubricated and prepared for immobilisation.

Storage should be in a dry, well-ventilated place.

When putting the equipment back into operation during the fertilising season, manually turn the t.d.f. of the angle box and check that the opening and closing levers are in perfect working order, lubricate if necessary.

# DISMANTLING THE MACHINE

# CHAP11

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## **3. ENVIRONMENTAL RESPONSIBILITY**

Protecting the environment is a growing concern for machinery and equipment manufacturers. The selection of recyclable materials, the use of biodegradable lubricants and the concern to build increasingly energy-efficient machines are some examples of this responsibility.

By ensuring the regular maintenance of their machinery and equipment, owners are contributing not only to optimising consumption, but also to reducing atmospheric pollution and environmental noise and, consequently, to the health of the planet.

- **DISMANTLING THE EQUIPMENT**

At the end of its useful life, don't dispose of this equipment in the environment. As well as contributing to environmental pollution, you are endangering people and animals.

When "disposing" of the machine, you must take into account the environmental regulations in force with regard to the environment and the recycling of the materials that make it up.

The materials used in the construction of this equipment are 100 per cent recyclable. Materials must be grouped by type before collection for dismantling.

Turn to companies that specialise in collecting and dismantling this type of equipment, or if in doubt, contact the manufacturer or legal representative of the equipment.

# SPREADING

# CHAP12

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## TECHNICAL ADVICE ON SPREADING

The quality of mechanised fertiliser and seed spreading depends largely on the methods used in the field by the machine operator.

- 1) At the headlands and during manoeuvring operations, you should stop spreading and if possible, switch off the PTO. When starting a pass, you should avoid spreading product beyond the limits of the field. To this end, and taking into account the equipment's settings, only activate spreading once the machine is in a position where this is guaranteed.
- 2) Fertiliser and seed grains are generally very light and once thrown, their trajectory can vary depending on the wind. During spreading operations, if the wind speed is very high (over 3m/s), you should stop work, otherwise the product may be spread very unevenly on the ground.
- 3) Fertilisers with a regular grain size promote uniform spreading. We suggest you take this into account when selecting the product(s) to apply.



**WARNING: Spreading uniformity can vary significantly depending on the environmental conditions present. Wind and uneven terrain are factors to take into account during work.**



**WARNING: The spreading tests carried out with this equipment were performed in the laboratory, under optimum atmospheric conditions, in the absence of terrain irregularities and with products of small size variations.**



